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A TREATISE

ON THE

NERVOUS DISEASES OF WOMEN;

COMPRISING

AN INQUIRY INTO THE NATURE, CAUSES, AND TREATMENT

OF

SPINAL AND HYSTERICAL DISORDERS.

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TO SIR JAMES CLARK, BART., M.D., F.R.S., &c.

PHYSICIAN TO THE QUEEN, AND TO H.R.H. PRINCE ALBERT.

Sir,

I am happy in having permission to place this work under the sanction of your name, by dedicating it to you. I am aware there are those who will assert, that the subject upon which I have written is too dignified and interesting to require any other introduction to the world than its own merits. In support of this proposition, the philanthropist might observe, that all the best feelings of humanity should urge us to continued effort for the welfare of the sex; the political economist might advance that the power of a people is indissolubly connected with the physical well-being of its females; and the moral philosopher might show, that the moral and intellectual greatness of Britain is based on the domestic virtues, pure morals, and elevated sentiments of her women.

These truths have my full assent: yet I cannot but feel that my own humble efforts to improve the health and ameliorate the sufferings of the sex, will be doubly efficient

under your patronage. And I am the happier in being permitted to avail myself of the sanction of your name, because I can publicly express my esteem for your talents, and my admiration of those noble sentiments regarding the legitimate objects of medical science, which you have avowed and advocated.

I have the honour to be,

Sir,

Your obliged Servant,

THOMAS LAYCOCK.

York, 22nd October, 1840.

PREFACE.

I GLADLY seize the opportunity of propitiating the reader in favour of my work, afforded by a preface; because I fear the peculiar plan I have adopted in treating my subject, may at the first glance be repulsive, especially to those of my brethren busily engaged in their professional duties.

I have often thought that treatises on the practice of Medicine professing to be free from theory, and to contain nothing more than a description of diseases, and the methods of treatment, are of questionable utility. The condensed style in which they are usually written, admits of no detailed exposition of the principles laid down, or of the facts from which those principles are deduced. The writer, consequently, appears to dictate, rather than to state an argument; to be the occupant of a professorial chair, rather than a fireside companion. The interest which physiology might give to the subject is lost sight of; and thus the work is dry and uninteresting, and never studied. If used as a book of reference, the rules for correct diagnosis and treatment are so precise, as to want the necessary elasticity of application to the ever-varying forms of disease; or so general, that they only increase the doubt and difficulty they are intended to diminish. At best, the practice recommended is empirical; and often is so far from being devoid of theory, that it is founded on very doubtful hypotheses.

Scientific medicine has a much wider range of immediate practical usefulness and prospective benefit than this mere practical medicine. Its rules are less applicable to individual diseases, than to the infinite variety of individual cases. It gladly makes use of empiricism; but it studies symptoms to demonstrate their causes, and relieves the former by removing the latter, or counteracting their effects. And when science fails to guide, it is still able to apply empirical knowledge with precision and effect.

Nothing can be more dignified and ennobling than the science and practice of Medicine combined. The science is a concentration of human knowledge on the study of man; the practice, a daily going about to do him good. However the scientific physician enlarges the sphere of his inquiries, the good of man is his great object,—the end of all his labours being to prevent moral and corporeal disease, to alleviate pain, to restore health. He turns his attention to the mutual action of mind and matter, that metaphysics may become a tangible and practical science, applicable to the moral infirmities of mankind. He makes general physiology and the physical sciences subservient to the advancement of human physiology, that human physiology may extend the powers and range of medicine. To medical practitioners of this class, the daily routine of their professional labours can never be what Dr. Samuel Johnson defined it—"A melancholy attendance on misery; a mean submission to peevishness; and a continual interruption of pleasure." They feel, it is true, that they have the melancholy privilege of studying man dissected by infirmity and anguish; but also that they are thus enabled the better to perform their duty, and to aid him in the time of his distress. And what can be less melancholy, less mean, more pleasurable, nay, more godlike, than this?

At the risk of being charged with presumption, I avow that

it is to this numerous class of my brethren I address the following pages; not doubting that the greatness of the object aimed at, will induce them to excuse the imperfect manner in which I have fulfilled my task; for imperfect I know it is. Yet, in justice to myself, I ought to remark, that I have spared no pains to render my work in every way worthy of a place in their libraries. It may, indeed, be considered as a second edition, revised and improved, since the outlines have already appeared as a series of articles in the Edinburgh Medical and Surgical Journal. With respect to its contents, I have had access to comparatively few books, but I am not aware that any other writer has illustrated so minutely and extensively the physiological and pathological action of the ovaria and testes on the system in general; I believe the inquiry into the periodic changes in the constitution of man has never yet been so extended as it is in this work; and, to the best of my knowledge, several of the facts and inferences I have stated on both these subjects are altogether new. I venture to hope that the mode in which I have applied some recent discoveries in the physiology of the nervous system to an explication of the laws of consciousness, will arrest the attention of the metaphysician. The action of the will on the sensorial fibres of the brain, the nature and laws of sensation, the extension of the doctrine of the reflex functions of the spinal cord to the encephalic ganglia, and all the consequences which necessarily follow, cannot fail, I think, to interest the intelligent professional reader, and afford matter for deep thought.

In the Second Part of the work, the comparison between the diseases of infantile dentition and of puberty, the demonstration and illustrations of the connexion between the gouty diathesis and diseases of the nervous system, the chapter on the pathology of the passions, the relations of paroxysmal diseases to other affections and to the encephalon, and

the different endowments of the lateral halves and extremities of the nervous centres, will, I humbly think, offer points of interest both to the pathologist and practitioner.

In the Third Part will be found many applications of the doctrines previously developed, which, I trust, will be regarded as both useful and instructive. Several obscure and doubtful symptoms are elucidated, the pathology of some important affections placed on a new and enlarged basis, and the empirical treatment of all is added. I would direct the reader's attention in particular to the opinions I have advanced on lateral curvature of the spine; to the pathology of some cutaneous neuralgiæ, including spinal tenderness; and to the section on morbid sensibility of the senses. I think the general facts and analogies there stated, in reference to the psychical action of colours, are of the highest importance. They throw a bridge across the gulf which hitherto has so completely isolated metaphysics from physiology; and by bringing our sensations in relation with mathematics, optics, and acoustics, will enable the inquirer after truth to make an inroad into this proverbially obscure region.

If the principles I have advocated and developed in this work, be applicable to the special diseases of which I have treated, they are applicable to the whole range of medicine, and I trust will be of general utility. This great object, I would here state, has been kept steadily in view.

THOMAS LAYCOCK.

York, October, 1840.

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INTRODUCTION.

THE nervous diseases of women have always attracted the attention of the physician and the multitude; and their various forms have been observed in all ages. Diogenes informs us[a] that Empedocles, a celebrated disciple of Pythagoras, obtained great fame by curing a female supposed to be dead, but whom he discovered to be suffering from hysteria. He termed the affection under which she laboured Apnöe (Ἄπνους); and maintained that a female might live in an apparently lifeless state for thirty days.

The most common form of nervous disease to which females are subject, namely, the hysteric paroxysm, and the corporeal peculiarities of those whom it attacks, are well described by Hippocrates under the name "strangulation of the uterus;" the ancients supposing that the disease originated in an ascent of that viscus to the diaphragm and throat, and that the dyspnœa and other symptoms were thus caused.[b] The treatment suggested by this hypothesis, namely, the practice of the *toucher*,[c] and the application of fragrant odours to the vulva, to induce the uterus to descend, threw these cases into the hands of a class of women, the representatives of which were found at Cairo, by Prosper Alpinus, and whose proceedings he describes in a very interesting manner.[d] Like these, the Greek women practised midwifery, treated the diseases of females, and taught them the cosmetic art, which, from the peculiarities of eastern notions, was and is intimately connected with obstetric medicine. Fortified by the opinions

[a] I. p. 93.
[b] II. De Naturâ Virginum.
[c] LIX. Sermo iv., cap. 68.
[d] III. Lib. iii., cap. 16.

of each succeeding writer on the πνὶξ ὕστερας, not less than by their own prejudices in favour of the uterine origin of all the unaccountable diseases of women, these doctresses termed them, in the aggregate, *hysteria*. The word seems to have been in general use, for Martial begins an Epigram[e] with

"Hystericam vetulo se dixerat esse marito."

Since that period the term, although occasionally limited to a hysterical paroxysm, has been very generally applied to almost all forms of nervous disease in women; and perhaps upon no other class of affections has more been said and written. Nor is it difficult to account for this circumstance. Their occasional singularity, their frequency, and the difficulty of distinguishing them from other and more dangerous diseases, have continually arrested the attention of the observant practitioner. Sydenham declares that few women, except such as work and fare hardly, are quite free from every species of this disorder.[f] Some of his reasons for writing on hysteric diseases were, "because they happen more frequently than any other excepting fevers, and his trivial observations might be of some advantage to practice."[g]

But the circumstances which have most contributed to raise these diseases into great and merited importance are, the remarkable similarity they bear to the most fatal maladies, and even to death itself, and the great consequent injury done to the patient by mistaking their true nature. They assume every shape, and attack every organ; now appearing as diabetes, now as ischuria; spasm at one moment, paralysis at another; every artery throbbing as if the system were labouring under intense fever, or a slow pulse, a death-like paleness, or profound insensibility, appearing to the inexperienced observer as the immediate precursors of dissolution.

The most common and injurious error is that which confounds the neuralgic form of hysteria with inflammation of some vital structure, as the synovial membrane of joints, the pleura,

[e] Epigr. 72, lib. iii. [f] IV. ii., p. 105. [g] IV. ii., p. 50.

liver, peritoneum. Limbs have been amputated when no organic disease has existed. "Next to the suspicion of peritonitis," Dr. Bright remarks,[h] "the belief that some individual organ in the abdomen is inflamed, has been amongst the most frequent errors in cases of hysteric pain. Again and again have I seen complaints of this kind treated as chronic hepatitis; and the disease confirmed, and the constitution undermined, by the continued and repeated use of mercury. At other times the spleen, the kidneys, or the uterus are supposed to be the seat of inflammation: on other occasions, when pain of the left side has been accompanied by irregular or hurried action of the heart, which is very frequent, the pericardium has been supposed to be inflamed, or organic disease of the heart has been suspected." The experience of every observant practitioner will confirm the truth of these remarks. It is lamentable to see the misdirected activity with which these supposed inflammatory diseases are treated, until the patient is brought into the most pitiable state of debility, or sinks under her complicated sufferings. Indeed, the successful treatment of this class of diseases, more than of any other, requires such a combination of general knowledge, sound judgment, and medical tact, as falls to the lot of few who are engaged in the daily hurry and turmoil of general practice.

In addition to these causes for a close and searching study of hysterical diseases, may be adduced the remarkable misnomered science of Mesmerism, which has lately sprung up and engaged the attention, not merely of the unthinking multitude, but of learned professors of medicine, of natural philosophers, and of men accustomed to observe accurately, to think closely, and to receive doubtingly. The slightest inference we can draw from the facts stated is, that the whole of the relations of mind to body require a thorough revision.

The only mode of threading the labyrinth in which the whole class of the nervous diseases of women is involved, is that left us by the illustrious Bacon, as the best for discover-

[h] V. p. 453.

ing the mysteries of nature; namely, to observe patiently, experiment cautiously, and generalize slowly; going from particular things to those which are but one step more general, and from these to others of still greater extent, and so on to such as are universal. However difficult this method be in its application to the advancement of the science of Medicine, it must be grappled with, or we shall make no progress.

PART THE FIRST:

COMPRISING SPECIAL PHYSIOLOGY.

CHAPTER I.

PRINCIPLES AND DEFINITIONS.

SECTION I.

FIRST GENERALIZATION, ESTABLISHMENT OF GENERAL PRINCIPLES.

1. By means of nosological arrangements many facts in pathology have been already generalized, and none more distinctly than those which constitute the subject-matter of this treatise. It ought to be remembered that each phenomenon of disease is a fact, or a series of facts; and a number of these occurring in a definite relation to each other, constitute a medical case. A medical case may be considered a well-marked instance of a number of cases having such a relationship as to constitute a class of diseases.

2. A number of such cases ought always to precede the deduction of general synthetical principles. In the present instance, the series would not only be extremely tedious in perusal, but in a great degree unnecessary; for the experienced practitioner will be already acquainted with them, and the inexperienced will find them more useful when related in that portion of the work which will be devoted to special pathology and therapeutics.

3. I shall content myself, then, with announcing, that the plan of the work comprises the consideration of the nature, causes, and treatment of some forms of disordered secretion; of the mental derangements, and of the neuralgic, spasmodic, and paralytic diseases peculiar to females,—occurring for the most

part without inflammatory action, and without organic disease of the nervous system.

a. First principle.—*The Nervous System the Seat of Hysteric Diseases.*

4. The terms of this generalization comprise an important general principle; one, indeed, acknowledged almost by every writer and observer; namely, that the whole class of hysterical affections have their seat in the nervous system.

It is true that the pathology of the early Greek writers had no reference to this doctrine. Hippocrates, or a writer in the books attributed to him, states, that there is a reflux of blood from the uterus to the heart and diaphragm, and these become congested and paralyzed; just as when a person by sitting long is affected with torpor and paralysis of one or other of the lower extremities, which are not relieved until the circulation be restored.[a]

5. It was not until some light was thrown on the functions of the nervous system that these mechanical and altogether fanciful theories were left in merited neglect. Hysteria and Hypochondriasis came then to be considered analogous diseases. Le Pois, Sydenham, Boerhaave, Whytt, Van Swieten, Flemyng, and many others supporting this doctrine; Hoffmann, Cullen, Good, Pujol, Pinel, Georget, and Brachet more lately maintained the distinctness of the two diseases, a difference of opinion easily explicable; but all agreed in the one great principle, that it is the nervous system which is mainly implicated in these affections.

6. But as regards the particular mode in which this system is affected, and the particular portions implicated in hysteria, there has been much difference of opinion. Sydenham, Stahl, Boerhaave, Cheyne, Flemyng, Whytt, Pomme, Georget, Andral, and others, placed the disease in the brain and nerves; Willis, Van Swieten, and Lobstein, in the sympathetic system; Hoffmann, in the uterus and membranes of the spine. As to the particular mode of disease there was again great variety of opinion. Sydenham and some of his successors considered

[a] II. De Morbo Virginum.

hysterical diseases to be excited by irregular motions of the animal spirits along the nerves; later writers thought they depended upon irregular vibrations of the nerves; Pomme[b] believed that all the nerves had become corneous from the evaporation of the fluid which should keep them lubricated, and brings forward some ridiculous arguments in support of his opinion. Ludwig attributed hysteria to some acrimonious principle seated in the nerves; and Frank, Bradley, Brown, Teale, Darwall, the Griffins, and Marshall, to spinal irritation; and this appears to be the latest and most novel view; being, however, equally vague and unsatisfactory as its predecessors.

7. There has been an obscure and indefinite doctrine advanced by almost every writer on the subject, which connects the nerves of the uterus in some way or other, not clearly explained, with the whole nervous system. Dr. Bright states that "the peculiar condition of the nerves in hysteria seems to owe its origin more or less directly to the extensive nervous sympathies of the uterus, which are capable of being anatomically demonstrated as well as pathologically inferred."[c] Dr. Copland advocates very similar doctrines. He thinks there is a peculiar state of the organic nervous influence, endowing the generative organs of the female, which nearly approaches to, or consists of, excitement or irritation of an active or sthenic kind, &c., attended by vital turgescence of the uterine system, and exciting a reflex action in the roots of the spinal nerves through the ganglionic system.[d] It will be observed, however, after a careful perusal of these various theories, that they afford no satisfactory explanation of many of the peculiar phenomena of hysteria; of the spasm of the glottis; of the remarkable embonpoint of many hysterical patients under the most meagre diet; of the occasional profuse salivation; of the periodicity observed in the paroxysmal forms; of the more frequent occurrence of the disease in spring and autumn; or, indeed, of a hundred other circumstances connected with its multiform varieties. But although these various opinions be all unsatisfactory, the concurrent testimony of all to one general fact, renders it certain that the

[b] VI. p. 9 and passim. [c] V. p. 465. [d] VIII. Art. Hysteria, § 61.

nervous system is its seat. This, then, must be received as a synthetical principle to guide us in our future inquiries.

b. Second Principle.—*Hysteria is peculiar to Females.*

8. The next general fact observed in this class of diseases is, that (with certain exceptions afterwards to be noticed) they are peculiar to the female sex. In this opinion writers are even more agreed than in that we have just considered. It is repeatedly asserted in the Hippocratic writings. Aretæus states, respecting the hysteric paroxysm,[e] "Young women suffer from this affection, the older are free from it." Paulus Ægineta remarks on the same disease, "This affection is frequently observed during the spring and autumn in lascivious girls, and sterile women, especially if they have been made sterile by drugs."[f] It is quite true that cases have occurred occasionally in the male sex, presenting the phenomena of convulsive hysteria; but so rarely, and under such circumstances, that even if their exact similarity to the hysterical paroxysm of the female be admitted, like other exceptions, they but serve to prove the general rule, namely, that it is the nervous system of women which is implicated in these affections.

c. Third Principle.—*Women of susceptible Nervous System more liable than others.*

9. If the physician cast his eye over the numerous detailed cases to be read in systematic works, and in the medical periodicals, he will find that, for the most part, the subjects of them were women endowed with great affectibility of the nervous system. The extract from Aretæus embodies this principle, the "mens vaga" being remarkably obvious in most hysterical women. Hippocrates also noticed the circumstance: "Mulieres quæ ab utero promptè strangulantur, idque sine febre in convulsiones propensæ sint."[g] These quotations sufficiently show that in all ages these diseases have attacked the same class of females, namely, those having great mental and bodily affectibility. This, then, will form a third synthetical principle.

[e] IX. De Vulvâ Strangul. [f] X. Lib. iii., cap. 71.
[g] II. Prædict. lib. i., § 119.

d. Fourth Principle.—*Hysteric Diseases appear only during that Period of Life in which the reproductive Organs perform their Functions.*

10. The fourth and last, and least general principle is, that women in whom the generative organs are developed or in action, are those most liable to hysterical diseases. "Seniores immunes sunt;"[h] "In juvenculis salacibus;"[i] "Salacitas major, major ad hysteriam proclivitas."[j] Indeed the general fact is so universally acknowledged, and so constantly corroborated by daily observation, that anything in the shape of proof is unnecessary. According to our rule, it is with this, the least general principle, that we must begin our synthetical analysis of related phenomena.

SECTION II.

THE GENERAL RELATIONS OF THE REPRODUCTIVE ORGANS.

a. Preliminary Considerations.

11. The influence which the generative organs must exert over the whole animal economy, may be easily inferred from the general fact that the final cause of all vital action is the reproduction of the species, and the preservation of the individual. The latter, indeed, in many cases seems merely subservient to the former, and the sole object aimed at in the changes which many animals undergo, particularly butterflies, silkworm moths, and other insects, which die as soon as they have performed their generative functions. And throughout the whole chain of being we find the power to reproduce the species is co-existent with the climax of developement and the consequent perfection of the individual.

But in the higher animals the mere generation of a new being is but an initiatory step of the reproductive process; the subsequent nutrition and defence of the young animal constituting an important part of the same general series of actions, and requiring the exercise of numerous instinctive

[h] Aretæus. [i] P. Ægineta. [j] XI. Sauvages, i., p. 589.

faculties by the parent; so that while the generative nisus is influencing a great number of corporeal organs, the mental receive a corresponding impulse; and the desire for sexual congress, the secretion of milk, and the love of offspring, are equally the results of the reproductive effort. We have thus a natural division of the phenomena connected with the generative organs into corporeal and psychological.

If we would fully investigate the relations of the sexual organs of woman to the phenomena of disease, we cannot confine ourselves simply to woman *per se*, but must extend our inquiries, as far as practicable, into the whole series of animal life, including man himself. Difficulties almost insurmountable in the present state of our physiological knowledge present themselves against such an arrangement as shall be unexceptionable in its connexions with pathology and therapeutics. The advance in our acquaintance with the anatomy and functions of the brain and nerves, made during the last thirty years, is such as to render it certain that ultimately all generalizations, as well pathological as physiological, must be solely based upon the anatomy and physiology of the nervous system. In the absence, however, of correct general principles, the best method of study will be to take each organ obviously in relation with the generative organs singly, and examine its relations in detail.

b. The Reproductive Organs defined.

12. Before we can proceed with the proposed comparison and analysis, we must take some one of the generative organs as a point of departure, and this is afforded by the ovaries. They, or analogous structures, are found in every form of vital matter with a constancy truly surprising. No analogy can be closer or more striking than that which exists between the essential generative structures of animals and the higher vegetables.

13. It ought to be observed too, that the ovaries and testicles are strictly analogous in their developement and functions. They are equally the products of the false kidneys, and at the seventh week of fœtal life form slender elongated bodies, situated below the true kidneys,—their permanent position in

many lower animals, as serpents for example. Sometimes the organ partakes of the character of both ovary and testicle; in some fishes of the genus *serranus*, each lobe of roe is made up of a portion of hard and soft roe, and these fishes have been considered as hermaphrodites; in perch, mackarel, carp, cod, whiting, and sole, there have occasionally been observed a hard or female roe on one side, and a soft or male roe on the other.[k] The cells of the ovary, usually called the Graafian vesicle, are filled with an albuminous fluid, in which the much more minute ovulum is deposited, and have no efferent duct. The semen in some fishes—the eel and male lamprey for example—is secreted in cells from which it escapes when ruptured into the abdominal cavity, and thence evacuated by a single orifice,[l] just as the ovulum escapes into the abdominal cavity to be received by the fimbriated margin of the fallopian tube, and conveyed through its minute orifice into the uterus. The ovaria have generally been called and considered an appendage to this organ, but the fact is exactly the reverse; the uterus being an appendage to the ovaries, just as the penis is an appendage to the testicles: it is a recipient for the ovum, and the medium through which the latter may be vivified by the male, exactly as the penis is essentially an organ for the transmission of the vivifying fluid. And, as in the classes of birds, fishes, and oviparous reptiles, there is no uterus, so in many of the latter there is no organ of intromission, neither being required in the structure of the animal; but in all, the essential parts are found,—in the female the ovaria, in the male the organ which secretes the fecundating liquor.

14. Again, the ovaries and testicles have a similar influence on the system in general. On their removal, all sexual desire is annihilated, certain sexual characteristics disappear, and, so far as a mere negation of these will allow, the individual approaches in form to the opposite sex. Dr. Seymour[m] and Dr. Lee,[n] quoting Pott's case, make it appear that on removal of the ovaries the voice of the female becomes hoarse, and hair appears on the chin and upper lip. If Pott had made such a

[k] XII. Introd., p. xxii.
[l] XIII. i., p. 431.
[m] XIV. iii., p. 767.
[n] XV. iii., p. 227.

statement, it must have been received with considerable doubt; for gravity of the voice of man, as well as of other male animals, is a positive characteristic of the male, dependent solely upon the presence of the testicles. But I think Pott nowhere makes such a statement. In two editions of his works [o] he states that, after removing the ovaries from a female, "she became thinner, and apparently more muscular; her breasts wasted, and she ceased to menstruate." Dr. Allen Thomson, also, has very recently observed,[p] that "in women in whom it has been necessary to extract the ovaries on account of disease, the voice is harsh like a man's; there is frequently a formidable beard, and hair on different parts of the body." I have searched very diligently for an instance of this sort without success; and even if one such were recorded, it might be very confidently pronounced incorrect, inasmuch as it would be contrary to our every day's experience in lower animals. We never see the spayed sow have the boar's tusks or neck bristles; nor the spayed heifer with the massy neck and short thick horns of the bull.

15. Having stated enough to establish the strict relationship existing between the ovaries and testes, it remains to add that we must examine their relations to the general system together, first in animals and man generally, and then the special relations of the ovaries to the sexual system of woman.

As this work is not intended to be an elementary treatise, many well-known facts and general inferences will be assumed; this physiological section being rather an outline which the reader may fill up at leisure from his own reading and observation, than a finished disquisition on the relations of the generative organs of animals. A very elaborate essay on Hermaphrodism by Dr. J. Y. Simpson, inserted in the second volume of the Cyclopædia of Anatomy and Physiology, may be consulted with advantage.

c. The Points of Difference between the Sexes.

16. The points of difference between the sexes will naturally constitute correlative and minor starting points in our pro-

[o] XVI. v., p. 184.—XVII. iii., p. 353. [p] XVIII. ii., p. 443.

posed synthesis; but it must be stated at the outset, that it is by no means certain that all the sexual differences depend upon the sexual organs: on the contrary, it is highly probable that there is an organization and developement of the primitive tissues to which these are subservient; in short, that the ovaries and testicles being subject in common with the whole system to this primary impulse or nisus, owe to it their own distinctive characters, and have the secondary influences they exert modified in such a manner in consequence as to bring out the special difference of the sexes as seen in the presence, texture, and configuration of certain special organs. There may consequently be two classes of points of difference,—the one general, and observed generally in the osseous, muscular, and vascular systems; the other special, and consisting in the presence or absence of certain cutaneous products, as crests, horns, hair,—in differences of secretion, as the menstrual and seminal,—or in the configuration of special parts, as the thorax, pelvis, scrotum, vagina.

CHAPTER II.

THE SPECIAL RELATIONS OF THE REPRODUCTIVE ORGANS.

SECTION I.

RELATIONS TO THE CUTANEOUS PRODUCTS.

a. General Remarks.

17. The cutaneous products presenting points of difference between the sexes demand our first attention, as being the most obviously connected with the sexual organs.

The products of the secreting structures embedded, as it were, in the skin, are scales, feathers, hair, horns, teeth, mammæ, and certain odorous and colouring matters. That the teeth are tegumentary appendages is now, I believe, generally acknowledged. Meckel first maintained the doctrine. Prout, Macartney, Mayer, Kaathoven, Bonn, Walther, and Lavagna, entertained similar views; the whole in favour of the doctrine having been ably condensed by Heusinger. To these names should be added that of Ashburner.[q] With regard to the colouring matter, sometimes it is an unmixed secretion, as when deposited in the rete mucosum of the negro, but most frequently enters into the composition of scales, hair, and feathers, in which it is sometimes permanent, sometimes not.

18. In insects and other animals low in the scale, as polypes, the skin is the germinal membrane, and of course performs much more important functions in these than in the higher classes of animals. According to Dr. Herold, (quoted by Kirby and Spence,[r]) the successive skins of the caterpillar,

[q] XIV. xiii., p. 111.

[r] XIX. xiii., p. 111.

the pupa case, the future butterfly, and its parts and organs, are all developed from the rete mucosum; it is only the sexual organs which can be discovered in the larvæ. Swammerdam, writing on the moult of the grub *oryctes nasicornis*, a beetle common in Holland, says, "It is not only the external skin which these worms cast like serpents; but the throat, and a part of the stomach, and even the inward surface of the great gut change their skin at the same time; some hundred of pulmonary pipes within the body of the worm casts each its delicate and tender cuticle."[s] There are certain organs of insects, as the jaws, antennæ, and others, which are influenced by the sexual organs, and which might be considered skin products, and so require notice here; but I think it will be better to notice them in another place.

b. Relations to the Colour of the Cutaneous Products.

19. In insects the sexual differences of colour are occasionally well marked, particularly in the brilliantly coloured species. The female butterfly differs from the male in the less brilliant colour of the upper surface of the wings, and in the presence of dark or dusky ocelli or fringes, which are absent in the male, or of a bright hue. Throughout the whole of the genus *polyomatus* this is very conspicuous: thus, the wings of the male *p. acis*, or mazarine blue butterfly, are of a deep blue, glossed with violet, those of the female of a dark brown, with a greyish fringe. The wings of the male *p. alcon*, or alcon blue, are of a violet blue, those of the female of a dusky brown; and this difference occurs throughout the whole genus.[t] In other genera there is the same difference observed, such as *colias; pontia cardaminis, ægrypnis paphia, apatura iris*, or purple emperor.

20. There is a difference also in the colours of fishes. Male stickle-backs are distinguished by the pink colour of the belly and under jaw, but both sexes exhibit more than usual brilliancy at the spawning season.[u] The pectoral fins of the grayling are reddish about spawning time, with small black

[s] XIX. iii., p. 196-7. [t] XX. Entomology, iii. [u] XII. ii., p. 79.

spots.[v] The male bull-trout is of a different colour at the same season.[w]

21. Birds, however, best display the sexual tints; with few exceptions,—all. In the pye-tribe, and in those whose tints are of a sober hue, there is little difference; but on the other hand, amongst humming-birds, the butterflies of aves, (19,) and birds of paradise, it is most striking; the male of the *ptiloris paradiseus* for example, a bird of New Guinea, is clothed in the most gorgeous hues imaginable, while the female is in homely russet brown.[x] The following are some instances amongst British birds:—chaffinch, linnet, snow-bunting, heron, lapwing, bustard, plovers, sand-pipers, ruffs, grebes, grouse, pheasants, partridges, and the farm-yard fowls.

22. The influence of the sexual organs on the colour of the plumage of birds is more strikingly obvious from the fact, that their action on the system is not constant. It is well known that the ovaries and testicles of birds are developed in spring; and that it is at this season that, like fishes, (20,) the cock bird is in his most brilliant colours; but when the autumnal moult has taken place, he is observed in a sober dress, either closely resembling the hen bird, or the immature male.[y]

c. The Feathers, Hair, Horns, and Tusks or Teeth of Animals.

23. The form of the plumage of birds, as well as the colour, is influenced by the sexual organs. The common cock is a good instance; and numerous are the species in which the cock birds are most remarkable for the beauty and size of their crests, neck, or tail-feathers: birds of paradise, the peacock, the pheasant, need only be referred to.

The distinctive sexual characteristics of many quadrupeds depend upon the growth of tusks, horns, or hair,—a fact so well known as to need little illustration. The lion, and the male of the canine race, are distinguished from the opposite sex by the greater growth of hair on their neck and shoulders. The male *phoca jubata* bellows like a bull, and has a mane; the female

[v] XII. ii., p. 84. [w] Ibid., p. 35. [x] XXI. i., p. 77.
[y] XXII. ii., pp. 182, 268. See chap. iii., sec. 1.

being without, and having a weak cry like that of a calf.[z] The tufts on the ears of lynxes, like that of many squirrels, appear only at the breeding season; and the same I have observed respecting the tufts on the ears of cats. The tusks of the wild-boar are sexual; so also is the tooth of the narwhal;[a] both being nothing more than the canine teeth enormously developed.

24. There are circumstances connected with the distribution of the hair on man deserving remark. In woman the pudenda and axillæ are the parts alone covered with hair; in man the chin, cheeks, throat, chest, back, and arms. Civilization, clothing, and other circumstances have so altered the skin of man, that it is seldom we see an individual presenting all these cutaneous marks of virility. When in perfection they strongly remind the observer of the neck hair of some apes, where the mane comes to a point between the shoulders. I remember meeting with a very perfect instance of the developement of the human hair, in the York County Hospital, and I took a note of the distribution of it as the man stood before me. He was an Irishman, and the hair was of a jet black colour. In addition to the usual hair on the pubes, axillæ, &c., the outer surface of each arm was thickly covered; on the shoulders there was a bushy patch, corresponding to each scapula, tapering down the back, in form and extent like the trapezius muscle, and becoming more scanty towards the inferior apex. The whole of the forearm was covered; at the part corresponding to the long supinator muscle, the hair curved downward towards the ulna, until it met another set directed towards the elbow, the line of junction being indicated by a raphe. It was remarkably bushy on the mammæ. Major Mitchell mentions a similar distribution of the hair on Australian aborigines: "Among them were several old men, who were very remarkable for the bushy fulness and whiteness of their beards and hair; the latter growing very thickly on their back and shoulders, gave them a very singular appearance," &c.[b] Now it is not a little curious,

[z] XXIII. ix., p. 335, 336. [a] XXIV. p. 502. [b] Three Expeditions into the Interior of Eastern Australia, &c. 2d. ed. London. 1839. ii., p. 92.

that in infants born prematurely, or of deficient developement, there is a similar distribution of a thick down over the cheek, shoulders, &c.; but in addition, the forehead is equally well covered, so that the soft eye-brows are scarcely distinguishable from the hair on the forehead above them.

d. The subtegumentary Fat; the Mammæ.

25. The characteristics of the surface of the human female are smoothness, roundness, and softness, conjoined with a remarkable delicacy of finish, all which are dependent upon a deposit of fat into the subcutaneous cellular tissue. Under all climates these characteristics of the sex are manifest, but in perfection only while the sexual organs are performing their appropriate functions, upon which they are plainly dependent. Proofs will be given elsewhere. (41.)

26. The mammæ have always been considered to have a direct connexion with the uterus, but this is certainly a mistake; they are influenced by the ovaries. Without at present adducing proof of this statement, it may be remarked, that, with the ovaries and uterus, they form a chain of organs which mutually influence each other.

e. The sexual Odours.

27. The sexual odours have a well-marked character, and are always some modification of the musk odour. Professor Tiedemann observes,[c] that "their secretion is particularly copious at the rutting season; and it is not improbable that the animals are excited to commit the generative act, by the influence which the volatile matters exercise over the nervous system through the organ of smell." The following is a good illustration of this opinion. The London aurelians make use of a virgin female of certain moths and butterflies for the purpose of attracting the male. From an experiment by Jurine, and other observations, it appears that the males distinguish the females by her odour, will fly in at an open window to her, and so soon as they approach her lose all

[c] XXV. i., p. 208.

sense of fear, and may be readily taken by the hand.[d] Hunters and destroyers of vermin make use of the generative odour as an irresistible lure of animals to their capture and destruction; and the housebreaker well knows by similar means how to silence and tame the most ferocious house-dog.

28. These odours are secreted by glandular bodies, situated in the tegument, either about the head, the thorax, or the generative organs. Many tortoises smell of musk, which probably proceeds from follicles connected with the cloaca. Several lizards, among others the iguana, have a row of small follicles with round orifices at the inner side of the thigh, which secrete, especially at the coupling season, an odorous fatty liquid. All crocodiles, especially when exposed to the sun, exhale a musk-scent which proceeds from two glandular follicles situated in the skin, at the inner part of the lower jaw; similar ones are also found near the anus. According to the observations of Prince Maximilian of Neuwied, the smell of the jacarre is strongest at the coupling season.

Most birds have a gland situated on the coccyx, which secretes an oily fluid, in some species smelling strongly. But it is in mammalia that the most numerous illustrations of the connexion between the generative organs and this musk odour is observed.

29. Some antelopes have large sebaceous follicles in the neighbourhood of the mammæ, as the *antilope oryx*, and the *antilope dorcas* (gazelle). In the shrew-mouse and mole there are musk-smelling glands on the sides of the chest; the opossum also has similar glands opening into the pouch.

30. In the genera *cervus* and *antilope* there are glands beneath the internal angle of the eye; on each side of the face of the bat, near the nose, and beneath the orbit, is a glandular sac, from which flows a fluid giving a strong smell of musk; somewhat similar structures are found on the face of the marmot. In both male and female elephants, in the temporal space under the skin, there is a large flat roundish gland, which secretes a fatty liquid, but more copiously at the

[d] XXVI. Vol. li., p. 55.

rutting time according to Strabo, Arrianus, and others, and in greater quantity from the male than the female.

31. There is one other circumstance to mention, namely, that in a vast majority of animals the musk odour is peculiar to the male, and to the male during the rutting season only; and proceeds from glands situated near the organs of generation, often close to the glans penis, or so that the musky sebaceous fluid can be shed over the glans. Amongst the animals in which this peculiarity exists may be mentioned the musk deer, and indeed the deer kind generally; the ram, the goat, the castor, the fossane weasel of Madagascar,[e] the Canadian musk rat, the common rat, the mouse, the hamster, the hare, and probably other rodentia.[f]

32. This musk odour is certainly the sexual odour of man. Sauvages remarks, "vapor fœtidus apud hircos œstro venereo percitos procul dispergitur; mulieres emunctæ naris affinem huic odorem in viris cognoscunt."[g] Aretæus says that the odour of the froth on the lips of men affected with satyrisis is not unlike to this;[h] and the ancients made the same remark respecting men who abstained from venery. The principal seat of this odour is in the follicles of the axillæ, and is not given off before puberty. It is most powerful in individuals who are continent, or with strong sexual powers, and in some is very pleasant; perhaps it would seldom have that disgustingly suffocative effect peculiar to it, if due attention were paid to cleanliness.

SECTION II.

THE PATHOLOGICAL RELATIONS OF THE CUTANEOUS PRODUCTS TO THE OVARIA AND TESTES.

33. To render the preceding illustrations more complete, and at the same time to adduce some facts in support of the doctrine that the ovaries, and not the uterus, are the influential

[e] XXIII. viii., p. 299. [f] Many of these illustrations are from Tiedemann's work, already quoted. [g] XI. ii., p. 420. [h] IX. Lib. ii., cap. xii.

organs in exciting the sexual changes already detailed, some pathological illustrations may be usefully presented to the reader; cases in which the ovaries or testicles have been removed or diseased, or influenced by menstruation or gestation, will best serve our purpose.

34. The removal of the testicles of cock birds is followed by a general change in the sexual tegumentary appendages. The cock capon has spurs short and blunt like those of an old hen, his neck and tail feathers have an appearance intermediate between that of the cock and hen; and he never crows after the operation. The hen capon is not so completely mutilated as the cock; the ovaries are not removed, but only part of the oviduct is cut away, so that the continuity of the canal may be destroyed. The hen thus mutilated makes imperfect attempts at crowing, the comb increases in size, and spurs shoot out; the feathers also alter, and the pelvis is much narrower than that of the egg-laying hen.[i]

35. But changes occasionally occur in the plumage and habits of hen birds analogous to those observed in the hen capon, without any actual injury to the ovaries. They have been most frequently observed in old hens, but happen also to young ones. Hunter published an essay on the subject.[k] Yarrell, in the paper just quoted, made further inquiries into the subject, and found they were not peculiar to old birds; for he found them in the young hens, in which it was subsequently ascertained that the ovaries were shrunken.[l] This metamorphosis of the hen bird has been observed in many species: the orange-shouldered widow, when past egg-laying, assumes the long handsome tail feathers of the male, and carries them also in his peculiar manner, namely, vertically, instead of horizontally.[m] The hen sparrow-hawk has been seen with the blue back of the cock;[n] and numerous other instances are mentioned by writers.[o]

36. The removal of the testes, or disease of the ovaries, of mammalia, produces analogous changes in their sexual cuta-

[i] Yarrell, XXVII. 1827, p. 273. [k] XXVIII. p. 80.
[l] XXVII. for 1827, p. 273. [m] XXIII. xiv., p. 224. [n] XXIX. iii., p. 449.
[o] XXX. Vol. xi., p. 388; also, XXXI., p. 93, and XXIX., Vol. x., pp. 302, 479.

neous appendages. An African lion in the Surrey Zoological Gardens, castrated when a few weeks old, is totally devoid of mane, resembling a very large lioness; he has never been known to roar, and is extremely docile.[p] Oxen, castrated boars and horses, all illustrate the same principle. Diseased ovaries alter the sexual characteristics of the female. Thus a hind (the female of the *cervus elaphus*) was shot by the Duke of Gordon, which had one horn perfectly similar to that of a stag three years old. It had never had a horn on the other side of its head, nor did it seem to have ever produced a fawn. Upon dissection the ovarium on the same side with the horn was found to be scirrhous.[q] Mr. Kirby, a keeper of stallions in this city, tells me that he has noticed that if a mare have tusks like a horse she cannot be got with foal. He also informs me that it is a common opinion, and he thinks a correct one, that if a mare be the twin of a colt, she will not breed; exactly the same circumstance we find stated respecting the free-martens, in which the ovaria or testes are imperfect, and which have an appearance intermediate between the sexes.

37. It is not uncommon to see slightly bearded women, but it has occasionally happened that they have had a stiff beard. I knew a somewhat aged female who shaved every day; many years ago one Barbara Van Beck was exhibited in London with such a beard as was never before seen on a woman's chin. Bingham knew a young female who had a beard, but who lost it after her marriage.[r] It is a popular opinion, and questionless founded on fact, that those women who have hair on the upper lip seldom bear children. In aged females, especially those who have been always unmarried, there is most usually a slight beard; the voice becomes strong, and the subtegumentary fat (25) is absorbed, giving the individual a lean meagre appearance. In all these cases there is such a change in the ovaria as partly approximates them in structure and influence on the system to the testes, and partly destroys their influence on the general system.

38. These detailed facts may appear somewhat useless to

[p] XX. Vol. ii., Mam. p. 120. [q] XXXII. ii., p. 356. [r] XXXIII. p. 33.

the reader, or at least too diffuse; but their utility may be shown by reference to a disease of the skin termed *acne*. Acne always occurs on those portions of the surface which in men are covered with sexual hair; indeed, it is limited to those described in paragraph 24. In man it is very common on the shoulder blades and forehead, in women and beardless youths on the chin and sides of the cheeks, corresponding to the locality of the whiskers; it is most common about puberty, or connected with sexual derangement, and is best cured by small doses of tincture of lytta and stimulating applications. Occasionally the face is so much irritated at each menstrual period as to resemble erysipelas. Borden mentions an instance.[s]

39. The hair of the head in man seems, in some mode not very evident, to be connected with the ovaria or testes. One of the aphorisms of Hippocrates[t] is to the effect that eunuchs neither are bald nor have the gout, and the same holds good of boys and most women. Buffon remarks "that baldness is peculiar to men. Women in the most advanced age, though their hair becomes white, are seldom affected with baldness, neither are children or eunuchs." Aristotle says no man becomes bald before having intercourse with woman.[u]

40. The pathological illustrations to be derived from the increased secretion of colouring matter are not numerous. Le Cat, Camper, and Gardien are generally quoted. Bomare, in an article cited by Blumenbach, mentions a French peasant, whose abdomen became entirely black during each pregnancy; and Camper gives an account of a female of rank who began to be brown as soon as she was pregnant, and before the end was as black as a negress. After delivery, the colour gradually disappeared. Le Cat relates the case of a female who was similarly affected in the face only during three successive pregnancies; and Gardien has recorded another. In an early volume of the Philosophical Transactions,[v] it is related that the face of a girl aged sixteen, suffering from amenorrhœa, turned suddenly black like that of a negro. The black

[s] XXXIV. Obs. xxx. [t] Lib. vi., § 28. [u] XXIII. iii., p. 147.
[v] Abridg. vi., p. 55.

matter could be easily wiped off, the skin being white underneath, and was of an unctuous consistence. There is almost invariably an increased deposit of colouring matter in the areola of the nipple, both during menstruation and pregnancy. Both Le Cat and Camper mention several instances in which the areolæ and nipples became quite black. Partial blackness is not uncommon about the pudenda: Haller saw it in this region in a female. During pregnancy patches of nigrities are often observed on the abdomen as well as on the nipples and face.

41. The natural deposit of fat beneath the skin of young females is sometimes so much increased as to assume the appearance of disease, and they then become remarkably fat, the mammæ being proportionably developed: such a state is often observed in aged females who have borne many children; and exactly the converse, it may be observed, occurs to old virgins; there is seldom any matronly plumpness in them. This excessive fatness in young women is most usually connected with a morbid state of the ovaria. Sometimes it occurs in a less degree, and gives a very charming roundness of outline to the person. Parent du Chatelet, in his work on the prostitutes of Paris, notices the embonpoint of these women, many of whom he says are models of symmetry and grace; and every large town in England will present such to the inquiring observer. Various explanations of this circumstance have been given, as the use of mercury and the warm bath, inactivity of life, rich food, &c. It may be observed that young and newly married females frequently surprise their friends by their improved looks after marriage. It is not uncommon to see females who have not been married until verging on fifty, and who had in a great measure lost the plumpness of youth, recover it in some degree after marriage.

42. It is more than probable that this embonpoint, as well as the harsh voice of prostitutes, has a sexual origin. The same appearance is very striking in many hysterical females, and constitutes one of those anomalous instances which confirm the truth of a general principle, by being themselves accounted for. The most common subjects of hysteria are those endowed with this brilliant plumpness of surface and delicacy of

finish; and these continue although the amount of food taken daily be incredibly small even for successive weeks and months.

43. In cases of this kind the mammæ, themselves tegumentary organs, partake of the general stimulus, and become enormously developed. It occasionally happens, however, that the hypertrophy is limited to them, and has always been found connected with obstructed catamenia, in females otherwise healthy. It would seem to depend on a metastasis of a morbid ovarian influence from the uterus to the mammæ; and accordingly the most efficient remedies in reducing the size of the latter are those which restore the menstrual secretion.[w] In a fatal case, recorded by Dr. Haston, the ovaria were larger than natural, and apparently diseased, and the uterus for two-thirds of its surface coated with lymph.[x]

44. In effeminate men the mammæ are frequently somewhat developed, and P. Ægineta remarks, that this occurs occasionally to youths about puberty to such an extent as to require amputation.[y] A curious instance of hypertrophy of the mammæ in a man accompanied by wasting of the testicles, and consequent upon a blow on the back, was lately recorded.[z] Renauldin mentions an analogous case occurring in a lecherous young man, who had an infantile penis and feminine form; and Dr. Holtrop, a Dutch physician, has recorded a similar one very recently.[a]

45. Conception is followed by increased growth of the mammæ, turgescence of the nipple, deeper shade of the areolæ, developement of the follicles scattered over the latter, and the secretion of milk. It is not yet certain that any one of these changes is peculiar to pregnancy; they are all the result of ovarian excitement, and occur in other states of the ovary than those produced by conception: thus the secretion of milk will occur in disease of the ovaria, the patient not being pregnant;[b] or in deficient menstruation.[c] I have observed

[w] XXXV. iii., p. 224, and xi., p. 245; also XXXVI. Ch. xviii.; also XXXVII. iv., p. 224. [x] XXXVIII. for August, 1834. [y] X. Lib. vi., cap. 46.
[z] XXX. i., 1838-9, p. 356. [a] CXXXVII. xxvi., p. 56.
[b] XXXIX. p. 219. [c] II. Aphor. lib. v., § 38.

it in a non-pregnant hysterical female ; and it occurs occasionally in old women, and even in men. The dark-tinted areolæ are also observed in females while menstruating, or suffering from hysteria, as I have shown elsewhere.[d] The follicular enlargement is analogous to the developement of acne on the face. The mammæ enlarge also during menstruation.

46. This section will be best concluded by the general inference that the cutaneous appendages and secretions reviewed at length are under the immediate influence of the testes and ovaria.

SECTION III.

THE PHYSIOLOGICAL AND PATHOLOGICAL RELATIONS OF THE OVARIA AND TESTES TO THE LUMBAR REGION.

47. By a glance at the fœtal developement, position, and nervous connexion of the testes and ovaria, we are at once led to consider them as in direct relation with the lumbar portion of the spinal cord. It is true that the kidneys, uterus, and other abdominal viscera are apparently in equally close relation; but there is an influence exerted by the former organs on the muscular and osseous structures in connexion with this region which is possessed by no other viscus: this is very distinctly shown by the difference in size of the male and female pelvis and abdomen.

48. In some *coleoptera*, for example, this difference is very obvious, the abdomen being larger in the females, and with one segment fewer, than in the males ;[e] also in many *arachnida*, as well as other species of insects ; namely, the ant, bee, &c.[f] Male and female crabs are, according to H. M. Edwards, so different, that the male and female of the same species have been taken as types of different genera; the female may be known at a glance by her wider abdomen.[g] In fishes in general, the abdomen is larger in the females than in

[d] VII. Vol. l., p. 38.
[e] XX. Entomology, ii., p. 113.
[f] XIX. iii., p. 299.
[g] XVIII. art. Arachnidæ.

the males.[h] But it is in the females of birds, and many mammalia, that the influence of the ovaria on the lumbar region is most obviously manifest; the larger size of the pelvis constituting in women one of the most striking characteristics of the sex.

49. The tegumentary appendages of the lumbar region and extremity of the trunk are not numerous. The mammæ in many mammalia are in the inguinal region, and there are cases in which the supernumerary mammæ of women have had a similar position.[i] The presence of the rump feathers of many birds is altogether dependent on the existence of the testes.

50. How far the removal of the ovaries of women would affect the bones of the pelvis is not made out. In the hen capon, (34,) we have an instance in which the size of the pelvic bones approaches to that of the male, contemporaneously with a change to the masculine form of the tegumentary appendages. It would be interesting to ascertain how far a similar change in the size of the pelvis occurs in hybrid birds. (35.)

51. In those individuals in whom the ovaria have been found rudimentary, the pelvis, mammæ, and other sexual organs remained undeveloped. A very recent writer states,[k] that absence of the uterus causes the female to assume the masculine characteristics; an opinion founded, I think, in the very common error that the uterus is the essential organ of generation; certainly not founded in fact. If the uterus only be absent or rudimentary, then all the external feminine characteristics are present. In the second volume of the Memoires de la Société Médicale de Paris, Professor Caillot has recorded the case of a young female with all these; yet, the uterus was altogether wanting, and the vagina only a narrow short canal an inch in length, and two lines and a half in diameter. Dr. Dewees[l] knew a young lady whose uterus was not larger than a man's thumb, the cervix being about the thickness of a writing quill; menstruation had never

[h] XII. Introd. p. xxi. [i] XXX. xii., p. 618, and ii. 1827-8, p. 394.
[k] XL. p. 512. [l] XLI. p. 53.

occurred, but the pubes was clothed, the mammæ developed, and there were sexual desires. Dr. Blundell [m] removed the uterus from a woman aged fifty; a year after, the sexual feelings were unimpaired, the mammæ large with full-sized glands, and the body plentifully supplied with fat. On the contrary, in Pott's case of removal of the ovaries, (14,) the uterus was left intact, yet the peculiarities of the female disappeared. In spayed animals there is removal of both uterus and ovaria, so that we cannot come to an exact conclusion with regard to them.

52. In a history related in the Philosophical Transactions [n] of a female in whom the ovaria and uterus were rudimentary, there were no signs of puberty, but there were no masculine characteristics; neither were the latter observed in a similar case noticed by Mr. Bayntun; [o] and in another, observed by Mr. F. Cripps,[p] the mammæ were undeveloped, and there was no hair on the pubes, or other marks of female puberty. The removal of the testes and ovaria of lower animals, and their shrinking in man, are both followed by a deposit of fat about the kidneys.

53. A few pathological illustrations may close this section. Very offensive exhalations from the genitals are occasionally transferred to the axillæ. In a case of nymphomania related by Alibert, and which came under his own observation in the Hospital St. Louis, the hips, thighs, and legs of the patient, a young female, were surprisingly plump, while the chest and upper extremities were in a state of complete emaciation.[q] Taking all the preceding statements together, we can fairly infer that the ovaria have a special and direct action on the structures of the lumbar region.

[m] XIV. iii., p. 798. [n] Abridg. xxiii., p. 225. [o] XIV. iii., p. 732.
[p] XXX. ii., 1837-8, p. 478. [q] XLII. xxxvi., p. 566.

SECTION IV.

THE PHYSIOLOGICAL AND PATHOLOGICAL RELATIONS OF THE OVARIA AND TESTES TO THE THORACIC REGION.

a. General Remarks.

54. THE connexion between the organs of generation and the neck and throat has been frequently observed. It was noticed by Hippocrates: "A cough ceases on the swelling of the testicles. This swelling of the testicles shows a mutual concert between the parts of generation, the thorax, and the breasts."[r] Again, "A tumour of the testicles on either side destroys a shrill voice, and without this, it cannot be altered."[s] "Those whose testicles are affected have a dry cough, and from venæsection in a cough, a tumour upon the testicles will cease, and upon their inflammation, a cough will arise."[t] Stoll, also, makes similar observations:—"Inter pudenda et pectus arcani quidam consensus;"[u] "a dolore forti ad testes irruente, tussis sicca solvitur;"[v] "cum testis intumescit a tussi, memoriam renovat societatis pectoris, mammarum, genituræ, vocisque."[w] Buffon noticed that peculiar relations exist between the throat and genitals, but also that we are ignorant of their causes; and very rightly adds, "How many curious and useful facts might be discovered, if physicians paid more attention to this interesting subject."[x] Darwin[y] and others have in equally distinct terms noticed the general fact; indeed, it can hardly escape the most superficial observer.

55. Now it is not a little remarkable that the organs of the upper part of the body influenced by the sexual organs, are those supplied by the class of nerves termed respiratory by Sir Charles Bell; and it is a happy circumstance that we can thus limit our field of inquiry in the most useful manner; basing it at the same time upon the best possible foundation. The parts in relation with this system are, 1. The external

[r] De Morb. Epid. Lib. ii., § i. [s] Ibid. § v. [t] Ibid. Lib. iv.
[u] XLIII. Pars vi., Aph. iv. [v] Ibid. Aph. ix. [w] Ibid. Aph. x.
[x] XXIII. iii., p. 147. [y] XLIV. iv., p. 199.

surface of the head and thorax. 2. The osseous, muscular, and glandular tissues of the face, throat, and thorax. 3. The thoracic viscera.

56. The external surface will comprise, therefore, that of the head, throat, and upper part of the trunk; anteriorly, occupying the chest to a line drawn across the epigastrium; posteriorly, corresponding to the trapezii muscles, and comprising, laterally, the axillæ, and outer surface of the shoulder, arm, and forearm. The most energetic action of the ovaria and testes being on the central portion of each lateral half. I have already, in previous sections, discussed the relations of the appendages of this extensive surface, namely, the crests, horns, neck-feathers, manes, bristles, beard, mammæ, and the moschiferous and coloriferous structures. It may be added to the previous statements, that the mammæ are axillary in some animals, as the porcupine; and that supernumerary mammæ have occasionally been observed in this region, in the human female.[z]

b. Relations of the muscular and osseous Structures of the thoracic Region to the Ovaria and Testes.

57. The superior size of the neck and thoracic region is observable in the greater proportion of male animals. The jaws, mandibles, antennæ, and other oral and thoracic appendages in many male insects, are widely different from those of the female. Some of the predaceous *carabidæ*, (*e. g.* the scarce British beetle, *cillenium laterale*,) have a deep notch on the anterior tibiæ on the inner side, towards the apex, above which there is placed a strong moveable spine.[a] The *onthophagi* beetles are known by the horn-like processes or tubercles which rise from the head or thorax of the male.[b] In the *melolontha fulla*, the antennæ of the male are developed into leaflets, while those of the female are only rudimentary. In the *leucanidæ*, the mandibles of the male are usually of very large size. On the contrary, it is a well-

[z] Dr. R. Lee, XLV. xxi., p. 268. Dr. Davis, XL., p. 778.
[a] XX. Entomology, ii., p. 112. [b] Ibid. p. 200.

known fact, that the females of several lepidopterous insects are nearly apterous, and some never leave the puparium, as the *oiketicus*, described by the Rev. L. Guilding.[c] In fishes the respiratory organs are more strongly marked, and occupy more space in the males than in the females; and certain peculiarities about the jaws, &c., are peculiar to the male, as the elongation of the under-jaw of the bull-trout, of the canine tooth of the narwhal.

58. The developement of the neck and thorax of the male of the higher animals is too obvious to need special notice. It is better to remark that there are some unaccountable exceptions to the general rule. The females of the hawk kind are nearly one-third larger than the cock; and Sir T. Raffles found the female of the two-horned rhinoceros of Sumatra to have a larger and heavier head than the male; all the females of the Tapir Malayanus ever caught were considerably larger than the male.[d] These exceptions are too few to set aside the general rule; but they are interesting as subjects for a new starting-point, in an investigation into the laws by which these sexual differences are regulated.

c. The Relations of the Organ of Voice.

59. The heart and lungs, and particularly the organs of voice, in connexion with the latter, have a constant and very definite connexion with the sexual organs. The larynx of males is the seat of one of his most striking characteristics in the greater number of *aves* and *mammalia*. The bellow of the bull, the loud and sonorous neigh of the stallion, the deep voice of the ram, the spirited notes of the common cock, and the song of male singing-birds, are all in remarkable contrast with the analogous sounds of the female, and castrated animals. Nay, the same general law is applicable to the whole insect tribe; the males only sing, the females are universally silent.[e] Hence the epigram of the Rhodian poet Xenocritus:

> "Happy the Cicada's lives,
> For they all have voiceless wives."

[c] XXXII. xv., p. 371. [d] XXXII. xi., pp. 268, 271. [e] XIX. ii., p. 394.

60. The changes which take place in the larynx are not so well marked in women as in men; but an attentive observer will notice, occasionally, even in them, the break of the voice which renders the intonations of young males so ridiculous, not only in man, but other animals. When the ovaries are fully developed, the voice of the female acquires its utmost melody and sweetness, which continue, with little depreciation, until the former organs begin to shrink, and the catamenia cease. The songstress of the opera or the theatre rarely appears before the public advantageously after forty-five, or fifty.

61. The voice, like the sexual appendages, varies with the removal, wasting, or developement of the testes and ovaria. The song of birds is confined to the period when the functions of these organs are duly performed; so soon as these cease, the song ceases. There is a curious instance mentioned by Buffon, of a hen canary that was so far a hybrid, as to sing so well that she was taken for a cock bird; when the mistake was discovered, and she was paired, she began to lay eggs, and renounced her song. The cock capon never crows, nor does the castrated lion roar. (36.) The voice of the eunuch is singularly shrill and piercing, very much like the squeak of some men who have no beards, narrow chests, and a double voice.

62. According to Dr. Fingerhüth,[f] the vocal tones of females having hypertrophy of the mammæ are somewhat similar to the last mentioned; in pregnancy and amenorrhœa they are occasionally curiously changed.[g] I have already enumerated certain characteristics of aged unmarried women, and, amongst the rest, mentioned their strong hoarse voice. The same characteristics are observed in prostitutes, so far as regards the voice; and Parent Du Chatelet attributes it to their vociferous manners; but, if carefully observed, it will not be found to resemble the hoarseness of those who habitually extend their voices, but rather a sonorous strength of tone, like that of the old virgin. It ought to be observed that this approximation to the voice of man is caused, probably, by some change in the ovaries, analogous to that of hybrid birds,

[f] XXXV. xi., p. 245. [g] XLII. Villermay, xxiii., p. 228.

prostitutes being, notoriously, sterile; total removal of these organs could only have the effect of destroying the melody and sweetness of the woman's voice; the larynx would not be developed.

d. Relations of the Heart and Lungs.

63. The thoracic viscera are larger in man than in woman; and are more liable to disease in the former. Spasmodic asthma is almost peculiar to men.[h] Of eighty-eight cases of angina pectoris, collected from various writers by Dr. Forbes, only eight were females; four of the eight were cured or relieved, while six-sevenths of the males died, or were unrelieved, but only two females died.[i] Of thirty cases of aneurism of the heart, collected by Mr. Thurnam,[k] only ten were women. Arterial aneurisms, according to Hodgson, occur eight times, to Lisfranc, eleven times oftener in men than in women.[l] The connexion of the testes with certain coughs in men has been already illustrated.

e. Relations of the Glandular Tissues.

64. The glandular tissues are those remaining to be noticed, together with others situated about the throat; namely, the salivary glands, and thyroid body, the tonsils, uvula, pharynx, eustachian tube, ears, and lips. The connexion between these and the sexual organs is less strongly marked, and, in consequence, natural history supplies but few illustrative facts; pathological phenomena are those which are most suited to our purpose. This part of the subject is altogether new ground. I shall therefore enter somewhat more into detail.

65. *The Salivary Glands.*—The parotid gland is occasionally affected by an epidemic disease, termed the mumps. The gland becomes swelled and painful, and so continues for two or three days, when the testes of males, and mammæ of females, become enlarged, and forthwith the parotid is restored to its natural state. Attention does not appear to have been directed to the state of the ovaries when this disease has

[h] Forbes, XV. i., 185. [i] XV. i., p. 83. [k] XLV. xxi., p. 225. [l] Ibid.

attacked females, the more obvious disease of the mammæ arresting inquiry; but it is exceedingly probable that they are enlarged. We must be content, however, to remain ignorant of their real condition, as the only effectual method of ascertaining it is by an examination per rectum,—a mode few practitioners would adopt, on account of the age and sex of the patient. A man in the York County Hospital had abscess of the left parotid, contemporaneously with abscess of the left testicle. Good quotes cases in which, after suppuration of the parotids, the pus was absorbed and carried off by the navel, rectum, and bladder. A malignant disease occasionally attacks the parotid and submaxillary glands of females who are about to cease menstruating.

66. That the salivary glands are affected in pregnancy is well established. Mauriceau[m] mentions increased spitting amongst the signs of pregnancy; and, according to Dewees, almost all women have a more than ordinary share of saliva secreted during the period of utero-gestation:—in one case he mentions, the quantity amounted to from one to three quarts per diem.[n] Indeed, so well known is the symptom, that the American women say of a pregnant female, that she is "spitting English shillings" or "cotton,"[o] and in Ireland, "long spits."[p] Dr. Montgomery also mentions the increased spitting of the pregnant;[q] and doubtless the symptom must be well known to most accoucheurs. It occasionally becomes severe, just as we have galactirrhæa, menorrhagia, &c., and it then excites more particular notice. An instance has been already quoted from Dewees's work. Dr. Osborne has recorded one in which it thus occurred during two pregnancies;[r] and in a recent German periodical[s] the cases of two females are recorded, in whom it occurred during fifteen successive pregnancies. Suppression of the lochia has been followed by profuse salivation.[t] The fluid vomited by pregnant women, according to Chambon de Montaux, exactly resembles the pancreatic.[u]

[m] XLVI. i., p. 69. [n] XLI. p. 115. [o] Ibid. p. 104.
[p] Dr. Cummin, XIV. xix., p. 436. [q] XCI. p. 55. [r] XXXV. xiv., p. 494.
[s] *Wöchenschrift für die Gesammte Heilkunde*, Sept. 1835.
[t] XLVII. p. 37. [u] XLVIII. i., p. 135.

67. *The Thyroid Body.*—Hitherto little positive knowledge has been obtained respecting the uses of the thyroid body; speculations about them have not been wanting, and for the most part have connected the organ with the larynx. Morgagni, examining the question whether this structure be glandular, or have a duct, quotes various authorities without any positive result.[v] Mr. White, a correspondent of the London Medical and Physical Journal,[w] satisfactorily ascertained that in the horse it is a mucous gland. He states that the termination of its ducts may be readily seen as minute papillary eminences, especially on the epiglottis and anterior parts of the larynx, the excretory ducts being continued down over the *rima glottidis* into the trachea, especially its posterior part. He thinks an increased secretion from it is a cause of "roaring." Bordeu thought that he had discovered the terminating ducts in man in the first ring of the trachea, but the researches of Sir A. Cooper, and Mr. King,[x] show that they pour forth a glairy fluid into the absorbent vessels.

68. Our principal knowledge of this body is comprised in the history of bronchocele; for unfortunately it is never made an object of pathological or necroscopic investigation unless plainly enlarged. It is remarkable, in the first place, that bronchocele is peculiar to females; as much so as hysteria. Of thirteen cases observed by Dr. Clarke in the general hospital at Nottingham, twelve were females;[y] and Dr. Manson, of the same town, found one hundred to be females in one hundred and six cases.[z] Dr. Inglis, in his treatise on the disease, makes the following statements:—Prosser saw fifty girls affected in a village in Derbyshire, but no male; Dr. Crawford found of forty-nine cases admitted into the Hampshire County Hospital, only one was a male; according to Dr. Forbes, of seventy treated in the Chichester Infirmary and Dispensary, three were males; Dr. Paley treated six males among one hundred and eleven; at the Pontefract Dispensary there were two males in fifty-eight cases; at Ripon, six in nineteen. That bronchocele is influenced by the sexual

[v] XLIX. i., p. 33. [w] xlv., p. 284. [x] LI. i., p. 429.
[y] VII. iv., p. 279. [z] LII., p. 115.

organs is clear from several circumstances. Most writers make it a disease of puberty; this is Dr. Inglis's opinion. Dr. Copland never met with it in females before that epoch, (to this almost general rule I have met with exceptions,) and he seldom observed it unconnected with uterine disorder.[a] Dr. Reid has frequently noticed the connexion between the disease and obstructed catamenia.[b] It is certainly affected at the catamenial periods. I have elsewhere[c] recorded the case of a patient who came under my own observation: she was of spare habit, had inharmonious voice, with hair on the upper lip, and suffered from bronchocele. At every catamenial period she found the tumour to enlarge, and she expectorated a quantity of grey glairy mucus which she supposed to come from the bronchocele. Professor Harrison observed a case in a nervous female, which increased in size whenever the menses were deficient; the patient had a polypus on the os uteri.[d] Dr. Reid states[e] that the custom of the ancients of measuring the bride's neck the day after marriage is still followed in Germany; indeed, enlargement of the neck was formerly considered one of the signs of rape, an opinion which Cabanis is at some pains to disprove.[f] Professor Odier, in his Manual of Practical Medicine, says that bronchocele makes the most progress in women during their lying-in; and Copland and Inglis make a similar statement.

69. *Pharynx, Fauces, and Œsophagus.*—The pathological illustrations of the connexion between the pharynx, fauces, and œsophagus, and the generative organs, are not striking; the most obvious is the vomiting of pregnant females; there are many others, however, derived from remoter sources, as the action of mercury, arsenic, &c. There is no reason to conclude that the cause of vomiting in pregnancy is seated in the stomach; indeed, it is doubtful whether vomiting is ever excited by sympathy with the stomach, as it is termed, either in pregnancy or any other visceral affection. This explanation is little better than those of the older writers: Etmüller, for

[a] VIII. i., p. 269, Art. Bronchocele. [b] VII. xlvi., p. 45.
[c] VII. Vol. i., p. 48. [d] XXXV. xvi., p. 329. [e] Loco cit.
[f] LIII. i., p. 283.

example, attributing it partly to the force of the genital aura, and partly to a fermentative motion of the humours arising from a repression of the menses; Haller, to a putrid principle in the semen entering the circulation, and acting like a putrid miasm. This vomiting may occur in various degrees of intensity, from simple morning retching to the most dreadful straining. Pechlin mentions a very odd instance; "gravidam nempè post conceptum viri aspectus et oscula concubitumque ita fastidisse ac fugisse, ut appropinquante marito nauseâ vomituque afficeretur."[g] This is a state resembling that of female brutes after conception.

Vomiting, however, is not peculiar to pregnancy, but may occur in other states of the ovaries. La Motte knew a female not pregnant who vomited "solâ actione coitûs;"[h] and two others who had violent vomiting at each menstrual period.[i] Morning vomiting is not uncommon about the cessation of the menses and in amenorrhœa.

70. Irritation about the fauces, as is well known, will excite vomiting; and it is very probable that the same excitement which affects the salivary glands, tonsils, and larynx, is extended to the fauces, pharynx, and œsophagus. The morning vomiting of the pregnant is usually accompanied by a spasmodic cough, popularly known as the "cradle cough," and by violent retching, terminating in vomiting. These phenomena occur in the same order as when the pharynx and fauces are mechanically stimulated.

71. It ought not to be forgotten that in certain birds, as the pheasant and parrot,[k] a change takes place on the internal surface of the crop at the time the young are about to be hatched. At this period that of the pigeon becomes thick, and takes on a glandular appearance; and from that part of the surface so changed, a sort of milk is secreted, of which use is made in feeding the young birds. Hunter, who has given a figure and description of the crop of a pigeon in this state,[l] considers it analogous to the change which occurs in the mammæ of mammalia during uterine gestation.

[g] Obs. Physico-Med., Lib i., Obs. 45. [h] LIV. p. 54. [i] Ibid., p. 75.
[k] XXIII. xii., p. 456. [l] XXVIII. p. 241.

72. *The Tonsils, Uvula, and Ears.*—The uvula and tonsils are much more frequently enlarged in women than men; and, like the parotid gland, mammæ, &c., are attacked most frequently by scirrhus, on the cessation of the generative nisus. In male camels the uvula is swollen during the rutting season, and protrudes from the mouth like a bladder.[m]

73. In goitrous countries there is not unfrequently congenital defect in the structure of the ears, causing deafness; and it is not a little curious that congenital deafness has been found connected with sexual developement, under other circumstances. Dr. Kramer relates that a man and his wife, both of them healthy, and without hereditary predisposition to diseases of the ear, had five daughters and six sons; all the latter were born deaf and dumb, the girls hear perfectly well.[n] In the same work is an observation quoted from Rudolphi's Physiologie,[o] of a man, dull of hearing of the left ear, who had three deaf-and-dumb boys, and two girls whose hearing was perfectly good.

74. The connexion between the ears and the respiratory nerves is not a little curious, also. Cassius Medicus has the following amongst his *problemata*,—the twenty-first,—"Cur aures oriculario specillo aliove instrumento fodientibus nobis, tussis interdum movetur non aliter ac irritatâ arteriâ?" Dr. Kramer remarks, in the work just quoted,[p] "acute harsh tones have been frequently observed to set the teeth on edge, to occasion a troublesome cough, vomiting, involuntary flow of urine, and hæmorrhage from the uterus; tickling and scratching the meatus excite in the larynx a troublesome irritation to cough," &c. I shall afterwards have to notice some very similar pathological relations between the teeth and the organs in connexion with the lower end of the spinal cord.

[m] XXIII. vii., p. 295; and XX. iii., Of Mammalia, p. 101.
[n] LV. p. 295. [o] ii. Band. i., sect. 302. [p] P. 34.

SECTION V.

THE PHYSIOLOGICAL AND PATHOLOGICAL RELATIONS OF THE OVARIA AND TESTES TO THE ORGANS IMMEDIATELY SUBSERVIENT TO REPRODUCTION.

a. General Remarks.

75. THE ovaria and testes, the clitoris and penis, the vulva and scrotum, the prostate gland (?) and uterus, are each the analogue of the other, being primarily the same structures, but varying under the impulse originally impressed on the primitive tissues, (16,) and secondarily on the first-mentioned and only fundamental organs. With regard to the clitoris and penis, which may be considered the sensorial organs of generation, it is to be observed that there is no reason to suppose that they act directly upon the ovaria and testes during coitus; on the contrary, it is highly probable the sensorial influence is first carried to the nervous centres, and reflected from thence upon the last-mentioned organs. Any remarks which may be made upon the relations of the sensorial organs will apply equally to those of the sexual passion; consequently, any detailed notice is unnecessary. The functions of the uterus, however, must have some notice, on account of its connexion with the phenomena of menstruation, conception, and pregnancy.

b. Conception and Utero-gestation.

76. I have already remarked that the uterus is simply a recipient for the ovum,—the medium through which it may be first vivified, and then supplied with nutriment. The stage of growth at which the fœtus can maintain an extra-uterine existence, varies in different animals, and will be referred to elsewhere. In woman it is forty weeks, or ten mensual periods. The phenomena accompanying pregnancy have been in a great measure detailed, so far as they bear upon our subject; those which have been omitted will be noticed shortly.

77. It may be briefly stated respecting conception, that it takes place in the ovarium; fœtal life commencing before the ovum has entered the uterus. Meckel and others have doubted this fact; but Bär of Königsberg has decided the question by his recent microscopic researches;[q] and it may be added, that the fact is quite in harmony with the mode of reproduction in vegetables. The entrance into the uterus indicates a phase of developement at which the organization is sufficiently advanced to enable the new being to draw nutrition from the uterus, just as its exit from that organ indicates the period at which it can endure the extra-uterine life, and draw nutrition from the mammæ. It is also some influence exerted in or by the ovaria, which causes the necessary changes in those organs; for the mammæ swell, and secrete milk before the birth of the child, as the uterus is enlarged before the ovulum enters its cavity. And even when the ovulum never passes into the latter, but remains in the ovary or fallopian tube, the uterus and mammæ still undergo the same changes as would have occurred if it had entered the uterine cavity; the uterus increasing *pari passu* with the mis-placed ovum, at least up to a certain size, for in cases of extra-uterine gestation the uterus is seldom found to be the size of the full period of gestation, because death generally ensues too soon. In addition it may be stated, that in almost all the inferior animals sexual desire appears as completely abolished as if the ovaries were removed.

c. Menstruation in relation with the Ovaria.

78. There is perhaps no one function which has excited greater attention than the menstrual: lawgivers, theologians, philosophers, of every age, and the whole mass of mankind have taken an immediate, because necessary, interest in the matter; and the consequence has been, that much stress has ever been laid upon its importance in the female economy. It would be useless to review at large the various opinions, respecting the causes of menstruation, which have been given to the world. By many it was thought, especially by the

[q] LVI. Proleg. p. iii.

ancients, that something noxious was elaborated from the system during menstruation; and, as it occurred in most women every lunar month, the process was termed the menstrual purgation. Some called it "the flowers," because as these precede fructification in vegetables, so does menstruation indicate in women the capability of being fecundated. Another very general opinion, and held until recently, was, that the menstrual flow was blood, and indicated that there was a regular plethora, which this flow relieved; that such plethora was necessary in women, in order that the superfluous blood might go to the nourishment of the fœtus; and, as menstruation usually ceases during pregnancy, there was little doubt of the correctness of the theory.

79. Various also have been the theories respecting the nature and source of the menstrual fluid. In Eastern nations, and by the ancients, it was considered something highly poisonous. Hippocrates pronounced it to be blood, and very erroneously stated that the menstrual fluid of a healthy woman coagulated like the blood of an animal offered to the gods;[r] but that in diseased females it sometimes acted on stones like vinegar.[s] The general opinion has been, that the discharge is sanguineous. It undoubtedly contains the colouring matter of the blood, but does not coagulate. It has been recently found to redden litmus paper, and to contain free phosphoric and lactic acids, and some phosphate of lime.[t] Many, on the other hand, have considered the menstrual fluid a secretion *sui generis;* as Haller, Bordeu, Hunter, Saunders, Dewees, Vaughan, Ramsbotham, and Sir C. M. Clarke.

80. As regards the source of the menstrual fluid, some have stated that it flows from the uterus, others from the vagina, and others again from both; it is quite possible, indeed very probable, that all are right; the secretion not being limited to any particular portion of the surface of the generative organs in general, but varying as to its source in individuals; it most commonly, however, flows from the uterus. Cabanis considered the menses to be excited by a

[r] De Mulier. Morb. I., cap. ix. [s] Ibid.

[t] Retzius, quoted in XXXVII. ii., p. 275.

particular humour which he supposed the ovaries to secrete.[u] Dr. Vaughan thought the menses to be a secretion dependent on the ovaria.[v] Dr. Lee, and more recently Dr. Gendrin, have the merit of having entered into some details tending to support this opinion; concluding it to be connected with some change in the Graafian vesicle.[w]

81. The menstrual period has been considered analogous to the "heat" of lower animals by numerous writers. Reaumur and others, down to Cruikshank and Blundell, have described the state of the organs of generation in brute females during this period; they have been found fuller than usual of blood, the fallopian tubes in a state of excitement, or applied to the ovary; the latter enlarged and studded with developed Graafian vesicles; and a serous blood-coloured fluid discharged from the vagina. There are various considerations which serve to support this opinion.

82. The following may be considered as the true state of the case respecting menstruation. Since the uterus itself is not an essential organ of generation, but merely superadded, and since the influence of the ovaria and testes over all the other processes and organs connected with generation, including the existence of the uterus and its developement during gestation, has been demonstrated, there appears not the slightest reason for withdrawing the phenomena of menstruation from their agency. It is in the ovaria, then, that we have to look for the causes of this process. There is every reason to believe, that Graafian vesicles are coming forward at intervals during the whole period in which the reproductive organs are active; that these vesicles enlarge and burst in succession, and shed the contained ovula, whether sexual connexion takes place or not; and that, from recent researches,[x] these changes in them take place at each menstrual nisus. If we remember, that during the period of heat in the lower mammals, as the ewe and sow, and of spawning and egg-laying in birds, fishes, reptiles, insects,—indeed, of every

[u] LIII. i., p. 280. [v] XXXIX. p. 206-12. [w] Lee, XV. Art. Ovaria. —Gendrin, reviewed in XXXVII. July, 1840. [x] Lee, op. cit. Paterson, VII. liii., p. 62.—Gendrin and Negri, XCIII. xxxii., p. 514.

class of oviparous animals,—these ovula become developed and are shed whether they be fructified or not, recurring at the same time to previous statements, (13,) we cannot help coming to the conclusion, that the period of menstruation is precisely analogous to the period of heat; that there is, in fact, an excited state of the ovaria at each period when ovula are shed; and that the capability of performing this periodic function distinguishes the ovaria of the woman from those of the impubescent girl, and virago.[y] If at this period an ovulum is vivified by the male semen, conception takes place; and this hypothesis at once explains the doctrine that women more readily conceive at the menstrual period, maintained by Hippocrates, Galen, and their numerous copyists among the ancients, by Dr. Montgomery[z] and others in later times, and generally believed by females themselves. When conception has taken place, a new action is set up in the ovaria, which may be considered as a permanent stimulus to the whole of the generative organs; and although the usual nisus may and does occur during pregnancy, its effects are rendered less obvious from its permanency. If, on the other hand, the discharged ovulum or ovula be unimpregnated, the same process is repeated at the next mensual period, and so continues until age, disease, or conception interferes with the ovarian system. But we shall find that this periodic movement is not limited to the ovaria, but that it is an affection of the general system in which the ovaria partake; and that it is through these the secondary system in connexion with them is influenced, and all the attendant phenomena (those of menstruation) excited.

[y] XXXVII. viii., p. 531. [z] XCI. p. 256.

CHAPTER III.

THE PERIODIC MOVEMENTS IN THE REPRODUCTIVE ORGANS OF WOMAN.

SECTION I.

MENSTRUATION IN RELATION WITH PERIODIC MOVEMENT.

83. Recurring to our previous statements, it appears that in many animals the developement of the testes and ovaria, and the shedding of the ovula and spermatic fluid, occur at definite seasons of the year, and for the most part in spring and autumn. The heat also of those animals, in which the genitals are in continuous activity, occurs at fixed periods, and these must be compared with the periodic movement of the human female. Again, the period of gestation in woman is a multiple of the mensual period, and it will be useful to inquire into the relations of the periods of utero-gestation in animals generally to that of woman.

84. The inquiry into the periodic changes in the constitution of man is of the highest importance, since they bear so directly upon both the prevention and cure of disease. Yet in comparison with the knowledge acquired respecting the periodicity of cosmological phenomena, how little do we know respecting these! Questionless the sun in its daily and yearly revolutions continually changes the face of nature, is ever increasing or diminishing the weight, temperature, and other qualities of that atmosphere which is the breath of life to man; the magnetic and electric states of the air vary with each day and season; the sun and moon excite the oceanic and aërial tides according to definite laws; and storms, tornados, and earthquakes attend with regularity upon their course: yet

is scarcely the least of the laws which regulate these mighty influences investigated in their relations to man in health or disease. And not only are there periodic influences ever acting upon man which are derived from without, but from the moment of his conception (and perhaps before) series of changes commence, enchained by definite laws, and depending for their due developement upon agencies seated in the individual organism. The more prominent links of these series are too obvious to escape notice; and the septennial phases of man's existence were remarked at an early period. The quotidian movement, as indicated by sleep and wakefulness, and the regular daily recurrence of appetites and functions, could not fail to be observed; and the monthly movement, from its marked occurrence in females, was as easily distinguishable. Since the phenomena of these periodic movements are open to observation, there can be no doubt that it is possible to arrive at a knowledge of the principles by which they are governed.

85. The phenomena of menstruation, like others depending upon the ovaria, appear at the time when those organs are developed; namely, at puberty. They consist in tumour of the mammæ, with a darker tint of the areolæ, weight and irritation about the pubes, pain in the loins, yawning, fastidious appetite, nausea, and not unfrequently a sense of tension in the muscles of the neck, headache, and alternate pallor and redness of the cheeks: in addition, there is a flow of a sanguineous fluid from the vagina, varying in quantity from one to eight ounces. These symptoms recur usually at periods of a lunar month, and continue three or four days. On conception taking place the menstrual flow is arrested.

86. In healthy females the process is seldom inconvenient or painful, but in others it is accompanied by a variety of symptoms affecting the whole system. There are frequently hysterical symptoms of different degrees of intensity; the patient is whimsical, irascible, and capricious; is affected with vomiting, neuralgic pains in the head, face, side, or legs; and any disease to which she is subjected is at this period aggravated.

87. Although the interval between each menstruation is a lunar month, or about twenty-eight days, the exceptions to the general rule are very numerous and have been often noticed. In the hot and low country of the Eboes, according to Mr. Oldfield, the females have the catamenia every three weeks.[a] On the contrary, the period is not unfrequently extended to five weeks, without any derangement of the general health, or abbreviated to two weeks.[b] Stoll, in the numerous instructive cases he has recorded, mentions many illustrative instances,[c] and similar are continually met with in practice. In the greater number it is connected with an irritable and weak habit of body, but not always. Mr. Roberton, of Manchester, in a useful and elaborate essay on this subject, found, in one hundred women, sixty-one to menstruate every month, twenty-eight every three weeks, ten at uncertain intervals, and one, a healthy woman aged twenty-three years, every fortnight. He remarks, that such cases are far from being uncommon, and generally exist as a family peculiarity. He is acquainted with two families in which this is the case; in one of them the peculiarity extends into several collateral branches, and he has been informed by professional friends of precisely similar instances.[d] From my own inquiries I find that some have "the whites" one fortnight, "the reds" the next. A variety of circumstances, pathological and physiological, lead easily to the inference, that although there be no flow of the catamenia every week, yet a change takes place at that period in many females, more or less felt, as the system is more or less robust; but strongly shown when excitability of the nervous system, either general or local, exists, and the phenomena of disease are developed, as paralysis, spasm, insanity, or hæmorrhages.

88. It is also to be observed, that this menstrual change takes place during pregnancy. It is singular that this doctrine, maintained by the ancients, should have fallen into neglect. Aëtius expressly states, "circa consueta purgationis menstruæ tempora aggravantur prægnantes et mammæ intumescunt,

[a] LVII. i., p. 133.
[b] LVIII. iv., p. 394.
[c] XLIII. passim.
[d] VII. xxxviii., p. 252.

lumbi difficulter moventur, vesica rubens et ignitum lotium excernit," &c.[e] Buffon, probably following Aristotle and the older Greek writers, maintained the same doctrine.[f] The fact is open to the observation of most professional men. I certainly can bear testimony to its truth. The whole of the facts just stated are in proof of the general statement at the conclusion of the last section (79); and further proof and references may be found in my paper in the fiftieth volume of the Edinburgh Medical and Surgical Journal, under the head of Amenorrhœa.

SECTION II.

THE PERIODS OF UTERO-GESTATION IN LOWER ANIMALS, IN RELATION TO THE MENSTRUAL NISUS OF WOMAN.

89. Are lower animals influenced by a periodic nisus weekly or monthly? This question I shall attempt to answer in the affirmative, as well as my limited space will allow. It has been already remarked that the change from fœtal to uterine life is a phase in developement which in man occurs at the end of the tenth menstrual period of the female. This is correct as regards the general fact, but it must be added that slight labour-pains occur at every menstrual period, but most particularly in the third, fifth, and seventh months of gestation; a fœtus of the last-mentioned age being able to maintain an independent existence.[g] The period of incubation of the egg is strictly analogous to the period of utero-gestation in mammalia; and the same remark is applicable to that of the ova of fishes, reptiles, and insects, with due limitations. For example, in insects, the egg, larva, and chrysalis states correspond to the whole period between conception and puberty in mammalia. Mr. Kirby remarks,[h] that winged insects, many branchiopod crustacea, and the batrachian reptiles, in leaving the egg, only

[e] LIX. Tetr. iv., Ser. iv., cap. 8.
[f] XXIII. iii., p. 79.
[g] II. de Morb. Epid. lib. vi., § viii.
[h] XIX. iii., p. 60.

quit their first integument, answering to the chorion or external envelope of the human fœtus; they therefore still continue in the fœtal state.

90. The periods of incubation and utero-gestation in aves and mammalia ought to be reduced to a common expression, or, in other words, the time should be stated in weeks; but this is a thing of not very ready accomplishment, because, firstly, the period is not of the same duration in individuals of the same species, there being in each class of animals exceptions to the general law; secondly, naturalists have in many cases reckoned by months, or stated the period only approximately; and, thirdly, there are not a few erroneous statements made by writers. Thus Buffon misstates the period of incubation of domestic fowls, of the common hen twenty-three days, the goose and duck thirty days, although so well known and open to daily observation. The following three tables will comprise all the information I have been able to collect on the subject. The first will comprise those in which the statements are made positively, and are a definite number of weeks; the second, those which are only approximative, that is, qualified by the term "about,"—but still definite; and the third, those not included in the preceding, whether positive or approximative.

91. Table the first, of the periods of utero-gestation, or incubation of birds and mammals, which are a whole number of months or weeks, and stated positively.

a. Mammals.

	Name of Animal.	Period in Months.	Period in Weeks.	Authority for statement.
1	Elephant	26		Buffon in XXIII. iv., p. 211.
	Elephant	20		Stark, LX. i., p. 136.
	Elephant	9		A naturalist, quoted in XXXIII.
2	Camel*	12		Atkins, LXI. p. 304.
3	Buffalo	12		M. Tavernier, in XXIII. vii., p. 351, note.
	Buffalo	9		Buffon, XXIII. iv., p. 211.
4	Horse		48	My own inquiries.
	Horse*	11		Buffon, XXIII. iv. p. 211.
5	Zebra	11		Ibid.

Name of Animal.	Period in Months.	Period in Weeks.	Authority for statement.
6 Bos Frontis or Gyall	11		Lambert, XXXII. vii., p. 303.
7 Ape	9		Atkins, LXI. p. 304.
8 Cow	9		Generally stated by farmers.
9 Walrus	9		Buffon, XXIII. iv., p. 211. Atkins, LXI. p. 304.
10 Whale	9		Ibid.
11 Reindeer *	8		Ibid. Buffon, XXIII. iv., p. 211.
Reindeer		33	Stark, LX. i., p. 146.
12 Doe	8		Atkins, LXI. p. 304. Bell, XXIV. p. 403.
13 Porpoise	6		Anderson, in XXIV. p. 475.
14 Doe of the Roebuck	5		Buffon, XXIII. iv., p. 212. Bell, XXIV. p. 409.
15 Goat *	5		Bell, XXIV. p. 435. Buffon, XXIII. iv., p. 212.
16 Chamois	5		Ibid.
17 Sheep *	5		Ibid. Atkins, LXI. p. 304.
18 Saiga	5		Buffon, XXIII. iv., p. 212.
19 Moufflen	5		Buffon, XXIII. iv., p. 211.
20 Hog *	4		Buffon, XXIII. iv., p. 214; and farmers.
21 Lioness		16	Keepers in Wombwell's menagerie. (These deny the correctness of the statements made by the French Naturalists.)
22 Tigress		16	
23 Pantheress		16	
24 Beaver	4		Stark, LX. i., p. 114.
25 Wolf		10½	Buffon, XXIII. iv., p. 212. (This is unquestionably incorrect.)
Wolf		10	Atkins, LXI. p. 304.
Wolf		9	Bell, XXIV. p. 206. (From S. Hunter and Desmarest.)
26 Fox		10	Atkins, LXI. p. 304.
Fox *		9	Buffon, XXIII.
27 Dog		9	Buffon, XXIII. iv., p. 212. Bell, XXIV. p. 204; and general belief.
28 Otter		9	Atkins, LXI., p. 304. Bell, XXIV. p. 136.
29 Isatis, or Arctic Dog		9	Buffon, XXIII. iv., p. 213.
30 Cat		8	Bell, XXIV. p. 190.
31 Polecat 32 Marten 33 Pine Weasel		8	Buffon, XXIII. iv., p. 213.
34 Ferret 35 Squirrel		6	Atkins, LXI. p. 304.
36 Mustela Sarmatica	2		Buffon, XXIII. ix., p. 104. (From Pennant.)
37 Hamster		4	Buffon, XXIII. ix., p. 38.
38 Guinea Pig		3	Atkins, LXI., p. 304. Buffon, XXIII. iv., p. 214.

b. Birds.

Name of Bird.	Period in Weeks.	Authority for statement.
39 Emu	9	Jesse, LXII. p. 113.
40 Ostrich	7	Buffon, XXIII. xi., p. 427.
41 Bustard *	4	Mudie, XXII. i., p. 57.
42 Stork	4	Buffon, XXIII. xviii., p. 268.
43 Ibis	4	Buffon, XXIII. xix., p. 11.
44 Swan	6	My own inquiries.
45 Musk Duck	5	Buffon, XXIII. xx., p. 128.
46 Goose, Duck	4	General observation.
47 Wild Duck	4	Buffon, XXIII. xx., p. 111.
48 Shoveller	4	Buffon, XXIII. xx., p. 150.
49 The Bacher or Pecker of Iceland	4	Buffon, XXIII. xx., p. 384.
50 Oyster Catcher*	3	Buffon, XXIII. xix., p. 118.
51 The laughing Gull	3	Plott in XXIII. xix., p. 427.
52 Common Partridge	3	Montagu, LXIII. p. 356.
53 Titrao Richardsonii	3	Douglas, XXXII. xvi., p. 142.
54 Hazel Grouse	3	Buffon, XXIII. xii., p. 208.
55 Wood Grouse	4	Buffon, XXIII. xii., p. 181.
56 Golden Oriole	3	Buffon, XXIII. xiii., p. 272.
57 Common Hen,* and most birds	3	General belief. Buffon, XXIII. iii., p. 11.
58 White-bellied Swift	3	Wood.
59 Many small birds	2	Buffon, XXIII. iii., p. 11.
60 Thistle Finches	2	Ibid.
61 White-bellied Swift	3	Wood in XXIII. xvii., p. 532, note.
62 Orchard Oriole	2	Wilson, LXIV. p. 191.
63 Ring Pigeon	2	Buffon, XXIII. xii., p. 487.
64 Canary	2	My own inquiries.
65 Siskin	2	Gardiner in XXIX. viii., p. 273.
66 Blue Titmouse	2	Anonymous in XXIX. v., p. 656.
67 Humming-bird	2	Capt. Lyon, in the Zoological Journal.
68 Salmon	20	Dr. Knox, in CXXX. xii., p. 477.

92. Table the second, of the periods of incubation and utero-gestation of birds and mammals, which are one day more or less than a definite number of weeks ; or which are said by authors to be " about " the period stated. The names of those marked with an asterisk in the preceding table belong also to this, but need not be repeated.

Name of Animal.	Period.	Authority for statement.
69 Manati	1 year nearly	Buffon, XXIII. ix., p. 375.
70 Dromedary	1 year nearly	Buffon, XXIII. iv., p. 211.

Name of Animal.	Period.	Authority for statement.
71 Ass	11 months	Buffon, XXIII. iv., p. 211.
72 Stag	8 months	Macgillivray, XX. vii. of Mam. p. 278. Buffon, XXIII. iv., p. 211.
73 Lion	5 months	Wood, in XXIII. v., p. 200.
74 Mole	2 months	Bell, XXIV. p. 101.
75 Capercailzie	4 weeks	Wilson, in Jamieson's Journal, July, 1832.
76 Carrion Crow	6 weeks	Buffon, XXIII. xiii., p. 41.
77 Quail	3 weeks	Buffon, XXIII. xii., p. 420.
78 Gray Partridge	3 weeks	Buffon, XXIII. xii., p. 364.
79 Red Grouse	3 weeks	Buffon, XXIII. xii., p. 227.
80 Tetrao Urophasianus	3 weeks	Douglas, XXXII. xvi., p. 136.
81 Castrocercus Urophasianus.....	3 weeks	Ibid.
82 Summer Teal	3 weeks	Buffon, XXIII. xx., p. 229.
83 Gallinule	3 weeks	Montagu, LXIII., p. 189.
84 Raven	3 weeks	Aristotle, in XXIII. xiii., p. 23. Stark, LX. i., p. 199.
85 Lapwing	3 weeks	Buffon, XXIII. xix., p. 52. Stark, LX. i., p. 289.
86 Jay.....	2 weeks	Mudie, XXII. i., p. 177.
87 Blackbird	2 weeks	Montagu, LXIII. p. 40.
88 Skylark	2 weeks	Buffon, XXIII. xv., p. 221.
89 Esculent Swallow...	2 weeks	Sir G. Staunton, in XXIII. xvii., p. 561, note.
90 Canary(spring hatch)	2 weeks	Buffon, XXIII. xiv., p. 82.
91 Senegal Finch	2 weeks	Buffon, Ibid., p. 157.
92 Aquatic Salamander	2 weeks	Stark, LX. i., p. 368.

93. Table the third, comprising the periods of utero-gestation and incubation, stated by authors, but not mentioned in the preceding.

a. Those which are contradicted by other Authors.

Name of Animal.	Period.	Authority for statement.
1 Lion	108 days	French Naturalists, quoted in XX. iv., p. 116; and Stark, LXI. i., p. 101.
2 Wolf	89 to 91 days	Annales du Musée. d'Hist. Nat. Tom. iv.
3 Hog	120 ds. or more	Bell, XXIV. p. 359.
4 Ferret	40 days	Buffon, XXIII. iv., p. 214.
5 Guinea Pig	25 or 30 days	Bell, XXIV. p. 353.
6 Wild Duck.....	30 days	Montagu, LXIII. p. 289.

Name of Animal.	Period.	Authority for statement.
7 Summer Teal	31 days	Linnæus, in XXIII. xx., p. 229.
8 American Raven ...	19 to 20 days	Audubon's American Ornithological Biography.
9 Canary (summer, or second hatch).....	12 to 12½ds.	Buffon, XXIII. xiv., p. 82.
10 Humming-bird (black).....	12 days	Latham, quoted in XX. ii., p. 61. Buffon, XXIII. xvi., p. 329.

b. Those which are weeks, and half a week, or half a day more or less than that period.

Name of Animal.	Period.	Authority for statement.
11 Jackal	59 days	Hunter, quoted in XXIV. p. 198.
12 Virginian Opossum	26 days	Barton, quoted in XXVII. for 1834, p. 343.
13 Didelphys Azaræ, another Opossum	25 days	Rengger, in Ibid., by Owen.
14 Kangaroo	39 days	Owen, in Ibid.
15 Hare	31 days	Buffon, XXIII. iv., p. 214.
16 Rabbit	31 days	Buffon, XXIII. iii., p. 11.
17 Turtle-dove	17 days	My own inquiries.
18 Vultur Aura	32 days	Audubon, in LXIV. vol. lxxi., p. 257.
19 Bittern	24 or 25 days	Buffon, XXIII., xviii., p. 432.
20 Kamskatchan Tern	17 days	Buffon, XXIII. xix., p. 332.

c. Those statements which are loose or doubtful.

Name of Animal.	Period.	Authority for statement.
21 Rat	5 or 6 weeks	Atkins, LXI. p. 304.
22 Field Mouse, and 23 Common Mouse	4 or 5 weeks	Buffon, XXIII. iv., p. 214.
24 Noctule Bat.....	exceeds 38 ds.	Bell, XXIV. p. 16.
25 Peahen	27 to 30 days	Buffon, XXIII. xi., p. 269, and copyists.
26 Pheasant	20 to 25 days	Ibid., p. 300.
27 Pigeon	18 to 21 days	Douglas.
Pigeon	17 to 20 days	Buffon, XXIII. xi., p. 486.
28 Starling	18 to 21 days	Buffon, XXIII. xiii., p. 181.
29 Nightingale	18 to 20 days	Buffon, XXIII. xiv., p. 308.
30 Common Coot	22 to 23 days	Sallerne, quoted in Ibid. xix., p. 327.
31 Vultur Californis ...	29 or 31 days	Audubon, in LXIV. vol. lxxi., p. 257.
32 Thick-knee	about 30 days	Mudie, XXII. ii., p. 86.
33 Great Titmouse.....	not exceeding 12 days.	Buffon, XXIII. xvi., p. 176.

d. Periods which are not a definite number of weeks.

Name.	Period.	Authority for statement.
34 Hare	30 days	Macgillivray, XX. vii., p. 298. Atkins, LXI. p. 304.
35 Parrot	40 days	Buffon, XXIII. xvi., p. 458.
36 Sheldrake	30 days	Baillon in XXIII. xx., p. 165. Swainson, Animals in Menageries, 12mo., 1838.
37 Great Plover.....	30 days	Desmazy, in XXIII. xix., p. 118.
38 Silver Pheasant.....	26 days	Swainson.
39 Golden Pheasant ...	23 days	Ibid.

94. The preceding tables afford the reader all the information I have been able to collect respecting the periods of utero-gestation and incubation; and from them he can readily draw his own inferences, or weigh the value of the authorities by reference to the works quoted. Of the *d* division of the last table it may be remarked, that they constitute the only available exceptions to the general principle that these periods are limited by weeks, and of these only the four last are really of value. In reconciling the conflicting statements, it ought to be observed that domestication and temperature modify the periods of incubation considerably; as, for example, in the peahen, canary, turtle-dove, &c.; also, that the period is in some instances stated from a solitary observation, as that of the bittern; and that in many other instances the difficulties in the way of observation are very great.

95. It must be borne in mind, too, that although the period of gestation may be correctly stated as regards the species, it apparently varies as regards the individual, being a week sooner or later. In the course of my inquiries on this subject, amongst the breeders of horses and other domesticated animals, I found this to be the general opinion, although I had great difficulty in obtaining numerical data. The following, respecting the period of gestation of mares, may be relied on, as I obtained them from a most authentic quarter. Mr. Kirby, of St. Lawrence Street, in York, a very respectable horse-dealer and keeper of stallions, fur-

nished me with the data from which I was enabled to calculate the period of gestation of twenty-seven thoroughbred mares. The mode in which the register is kept is the following :—A mare in heat being brought to be covered, each day in which she is put to the stallion is noted down. Near the end of the expected period of gestation, (eleven calendar months,) she is returned to Mr. Kirby, who notes down most carefully the day, and frequently the hour at which she drops her foal. In a few days she is again at heat, is again led to the horse, and again returned, probably to drop her foal as before. The following table may be premised with the further remark, that when a mare was covered on different days, say the 9th and 12th of April, the period is calculated from the last day, namely the 12th.

Month when covered.	Number.	Average period of Gestation.
February	3	48 weeks, 1 day.
March	6	48 weeks.
April	6	48 weeks, 6 days.
May	11	48 weeks, 2 days, and a fraction.
Total number and average ...	26	48 weeks, 2 days.

Of the twenty-seven, only three went with foal exactly forty-eight weeks, while the period in one extended to one year and four days. This was an old mare, so unruly and vicious that, at the time of covering her, she "was almost drowned in a horse-pond," as Mr. Kirby informed me. Of the truth of the fact as stated he had not the slightest doubt. The facts collected by Tessier, who made observations on the periods of utero-gestation of so large a number of animals as 2136, comprising cows, mares, rabbits, sows, sheep, asses, buffaloes, and bitches, and which are quoted by Dr. Montgomery,[i] exhibit the frequent irregularity in the length of the period. Thus a mare exceeded the usual period by twelve weeks, a cow by six, &c. The records of medicine, and particularly works on forensic medicine, contain many instances

[i] XCI. p. 267.

in which the period has been remarkably prolonged in women, and the question arises, how can these anomalies be explained?

96. It may be observed, that as the menstrual periods of women differ, so may that of utero-gestation; for if the former be at intervals of three weeks, the latter will occupy thirty-eight or forty-one weeks, supposing conception and parturition to take place at menstrual periods, and which in fact they do.

97. Again, from our previous statements it appears that at those periods when the ovaria of animals are developed, probably during the period of heat, and at each menstrual period in women, ovula are shed from the ovaria. In virgin fowls these attain the size of a common egg, but are never developed into a perfect chick because not impregnated by the cock. Now it does not follow that conception takes place at every coitus, because it is necessary that an ovulum shall be ready to be impregnated, and this only occurs at certain periods, as has just been remarked. But if ovula are shed three, four, or five days after copulation, will they be vivified by the male semen so long after that act? If the possibility be allowed, we have a hypothetical explanation of some of these anomalies.

98. Again, an ovulum, although vivified, may be dormant as it were, for one whole monthly period, or until the generative system be in a state suitable to its normal developement; and this is quite possible, for heat and cold, and other circumstances not known, will retard the developement of the ova of insects for months, and even years: of this kind are those cases in which, of the same batch of ova from the same parent, and deposited at the same time, some will be developed in nine months, others in eighteen, while others are thirty in coming to perfection.[k]

Lastly, there is certainly a difference in the periods of developement caused by the sex of the progeny. This is notorious in insects (102); breeders of cattle always expect a bull-calf when the cow has passed the usual period of gesta-

[k] XIX. iii., p. 266.

tion; and it may be incidentally mentioned that a lady of rank had five daughters born at the full time, but she aborted three times, and each time the fœtus was a male. Many women have sickness and disorder of the health only when pregnant with a boy. However we may explain these exceptions, exceptions they must be allowed to be, and cannot overturn a general law founded on thousands of particular instances, occurring daily and with the greatest regularity.

SECTION III.

PERIODIC CHANGES OF INSECTS.

99. The preceding tables of facts have been brought forward as illustrations of the general principle that periodic changes occur in animals at periods of weeks, or multiples of weeks; and if we wanted further applications of the principle, we need only turn to the duration of the various phases of insect life; the moults in the arachnidæ and their congeners, and in reptiles, birds, and mammalia; the hebdomadal, bi-hebdomadal, and mensual paroxysms of periodic diseases, and the large class of phenomena upon which the whole doctrine of critical days is founded; all being regulated by the same general law.

This, however, is not the place to enter into a demonstration of the law, and its application to the extensive series of facts just mentioned.[1] Yet a few illustrations may be useful in pointing the observation of the reader to a large class of phenomena which may be made available in advancing the theory and practice of medicine, but hitherto altogether useless.

100. The illustrations among the insect tribe are numerous. The egg of the neuter of the domestic bee is hatched on the fourth day, and in twenty is a perfect insect; the neuter is thirty-six hours in spinning its cocoon, the queen bee only

[1] I propose shortly to review the whole in an Essay I am preparing for the press on the periodic changes in the constitution of man.

twenty-four. The egg of the wasp is seven days in the cell before the larva appears. The eggs of the mole-cricket are hatched in a month,[m] of the ant in fifteen days;[n] those of the glow-worm require six weeks;[o] of an ichneumon, but three or four days.[p] Leeuwenhoek found that the eggs of the common louse were hatched on the eighth day, and the insect laid eggs when a month old. The ova of wasps are perfect insects in a month;[q] of the *phalæna* are hatched in fifteen days, and the pupa state is about twenty.[r] Mr. Milbank, in a communication printed in the Transactions of the Yorkshire Agricultural Society, respecting the common black caterpillar, states that "the ova are hatched in ten days; the larva changes its skin three times, at intervals of seven days each, and it then spins its cocoon." Seven-tenths of those he observed were perfect insects in twenty days, and the remainder hybernated, and were not developed until eleven months after: all were of the same age, size, &c. (See paragraph 98.) The eggs of the *cecidomia tritici* were visible on the wheat plant on the 23rd of June: they were larvæ on the 30th, and pupæ on the 29th of July following,—in all five weeks.[s]

101. It must not be forgotten that the period of incubation and of the other phases in the developement of insects, is modified by temperature and domestication, as is the case in birds and some mammals. This fact is very obvious in the natural history of the silk-worm: the period occupied by the larva state is much more definite than that of incubation, and that of the pupa more definite and regular than either. It is to be regretted that the time of duration of these conditions for the most part is stated only approximatively, that is, with the addition of the word "about." The following are some of those which are positively stated:—Mr. Denny had three larvæ of the *sphinx atropos* which went into the earth on August 22nd, 24th, and September 2nd, respectively; they appeared as perfect moths on October 16th, 18th, and 27th, or exactly fifty-six days between each period.[t] According to Professor Rennie, the lilac caterpillars hatched on the 12th of

[m] XXVI. li., p. 183. [n] LXV. p. 72. [o] XXIX. viii., p. 264.
[p] XXVI. vi., p. 417. [q] LX. i., p. 354. [r] Ibid. p. 369.
[s] Mr. Sherriff, in XXIX. ii., p. 448. [t] XXIX. vi., p. 272.

July, became chrysalides on the 15th of August, or in five complete weeks.[u] The argent and sable butterfly continues in the pupa state one month.[v] The water beetle (*squilla aquatica*) remains in the chrysalis three weeks,[w] as also the tortoiseshell beetle (*cassida viridis*).[x] The larvæ of the wood-piercer bee eat for twenty-one days, then fast about seven, and become nymphs, from which the perfect insect emerges on the twenty-second day.[y] The *ichneumon ovulorum* is developed from the cocoon on the 14th day;[z] a species of *cassida* entered on the pupa state on the 16th of July, and the perfect insect appeared on the 23rd, or in seven days.[a]

102. It is not a little curious that there is a definite difference in the periods intervening between each phase in the male and female of insects. Thus Mr. Rennie found that the eggs of the puss-moth containing males were hatched two weeks before those containing females, and the same has been observed with respect to ants. On the contrary, the queen bee is perfected four days earlier than a neuter, and eight earlier than a drone.[b]

The approximative statements respecting the period of the larva and pupa states of insects are all corroborative of the general law of heptal developement, and may be found scattered through the numerous works on Entomology lately published, especially on lepidopterous and coleopterous insects. A *rigidly* exact series of observations on the time occupied between the various changes and developements of insects is however a desideratum, and a lover of entomology could not occupy his time more usefully than in making them. In not a few instances there is an order observed somewhat analogous to that of the critical days.

103. A few facts from the moulting of insects will serve to illustrate this last, and the general statements. Moulting is the disconnexion of the tegumentary appendages from the cutis vera. It is always conjoined with considerable disturbance of the system at large, and is only one of a connected

[u] LXIV. lxxx., p. 19. [v] LXIV. lxxvi., p. 120. [w] XXVI. li., p. 160.
[x] Ibid., p. 162. [y] Reaumur. [z] XXIX. iii., p. 51.
[a] Ibid. p. 524. [b] XIX. ii., p. 139-148.

series of phenomena. Dr. Carpenter is, I think, in error when he states, in his very useful work,[c] that the exuviation of the skin is peculiar to serpents among the vertebrate animals. All animals shed the appendages of the skin, whether it be an epithelium, as in the annulose animals and serpents, or hair or feathers, as in aves and mammalia. Moulting indeed occurs in all animals, not excepting man, nor probably fishes. In insects the change has a tertian, quartan, or hebdomadal type, as, for example, in the black caterpillar. (100.) Sir J. Banks had a spider, which he kept for a month, when it cast its skin; and five new legs, which had been cut off, appeared and grew for three days; in twenty-nine days the spider again moulted, and again the legs grew for three days.[d] The common *cyclops* (a crustaceous animal) is nearly spherical at first, and has only two antennæ and four short feet; on the fourteenth day a small projection appears on the hinder part of the body, on the twenty-second it acquires a third pair of antennæ, and on the twenty-eighth it changes the tegumentary covering of its body.[e] Major General Hardwicke found the *boa phrygia* of Shaw to cast its skin every thirty or thirty-five days.[f]

SECTION IV.

THE PERIODIC RECURRENCE OF "THE HEAT" OF MAMMALS.

104. In comparing and analyzing classes of facts like the preceding, it must be remembered that each has a relative place in the series, from which it cannot be dislocated without disarranging the whole. Thus there appears no possible relation between the menstrual period in woman, and the pupa state of insects, until we trace the relation of menstruation to utero-gestation, and of this to animal developement in general. The comparison of the period of heat with the menstrual is much more instructive and tangible than of the preceding, from the analogy existing between the two, as in the fact that it disappears after a fruitful copulation, just as menstrua-

[c] LXVI. p. 76. [d] XXXII. xi., p. 394.
[e] H. M. Edwards, in XVIII. i., p. 787. [f] XXXII. xiv., p. 582.

tion is usually checked by pregnancy. In this, as in other vital phenomena, the changes of nature are so gradual that it is almost impossible to calculate the intervals and duration with the necessary precision.

105. Darwin informs us, that in mares and bitches, if the venereal orgasm be disappointed of its object, it recurs at monthly periods.[g] Dr. A. Thompson states, that the ewe, if unimpregnated, comes in heat every fourteen days; the cow, some apes, the mare, ass, and buffalo, every four weeks.[h] The heat of the she-ass returns seven days after delivery;[i] of the she-wolf,[j] and roe-deer,[k] each fifteen days; of the female racoon, six weeks.[l] The females of the *phoca ursina* are in heat a month after they have brought forth;[m] and the lioness in seven days, as I was informed by an intelligent keeper in Wombwell's menagerie: one under his care had three litters of cubs in one year. Mr. Kirby, before mentioned, informed me that the heat of mares returned in fourteen days, if conception had not taken place, but another breeder tells me seven days. A Clergyman, and a neighbour of mine, the Rev. J. Acaster, had a heifer which was the twin-calf of a bull. To ascertain the truth of the common observation, that such a twin was barren, he kept this animal, and when at heat had her frequently taken to the bull; she never was got with calf, and the heat returned regularly every four weeks. A respectable and intelligent grazier told me, as an inexplicable circumstance, that he had a cow which, while in calf, was in heat every three weeks, and calved three weeks after the last time of heat. Now this explains three things:—first, the reason why an animal will pass the usual period of utero-gestation; secondly, the analogy between the menstrual period of woman and the heat of lower animals; thirdly, the occurrence of menstruation during pregnancy. With these facts before us, there appears no reason to doubt the occurrence of menstruation in monkeys. Kolbe says he was an eye-witness of the fact.[n] Buffon quotes the history of an ourang-outang, written by Allemand, which had a regular periodic

[g] XLIV. iv., p. 238. [h] XVIII. ii., p. 441. [i] XXIII. iv., p. 175.
[j] Ibid., p. 193. [k] XXIII. v., p. 63. [l] Ibid., p. 161.
[m] XXIII. ix., p. 307. [n] LVIII. iv., p. 410.

discharge until attacked by the scurvy;[o] and he asserts that the following monkeys menstruate:—the Barbary ape, the ribbed-nose baboon, the lion-tailed baboon, the pig-tailed baboon, the hare-lip monkey, the malbrouck, (*simia sinica*,) the white eyelid, the varied, the green, and the moustache monkey.[p]

106. The rutting of the males is somewhat analogous to the heat of the female. That of the stag continues three weeks;[q] of the camel, according to Thevenot,[r] six weeks; of the buck chamois, according to Gaston Phœbus, four weeks;[s] of the red deer, about three weeks.[t] The time from the commencement of pairing of the *vultur aura* to the commencement of incubation is two weeks. The ring-pigeon lays eggs for fourteen days after pairing, sits other fourteen days, and in fourteen more the young ones leave the nest.[u] The goldfinch completes its nest in three days; it is left unoccupied four days, when the first egg is laid.[v]

107. Reviewing the whole of the preceding facts, it appears a legitimate deduction, that in animals changes occur every three and a half, seven, fourteen, twenty-one, or twenty-eight days, or at some definite number of weeks. The phenomena of the diseases to be treated of, will constitute pathological illustrations of this, as well as the other general laws, developed in the preceding sections.

SECTION V.

THE VERNAL AND AUTUMNAL CHANGES.

a. General Considerations.

108. The heat of summer and the cold of winter are both noxious to the generative powers of animals and vegetables, but more especially the latter. It is when there is a medium temperature in the atmosphere, namely, in spring and the end

[o] XXIII. x., p. 81. [p] Ibid. [q] XXIII. v., p. 21.
[r] XXIII. vii., p. 295. [s] XXIII. viii., p. 88. [t] XXIV. p. 401.
[u] XXIII. xii., pp. 487, 489, note. [v] Rennie, in LXIII. p. 215.

of summer, that the changes in the generative organs of animals are most to be observed.

If we compare the various phenomena with each other with reference to these seasons, some curious general facts may be elicited. The spring-time is proverbially the season of bloom, but it not unfrequently happens that apparently an attempt at a second spring is made about the beginning of autumn; for fruit trees frequently blossom again at this period, and many vernal flowers invariably appear, as the crocus and primrose; while others have also a second flowering, as in the fruit trees.

> "—— ver assiduum atque alienis mensibus æstas;
> Bis gravidæ pecudes, bis pomis utilis arbor."
>
> VIRG.

b. Double-breeding in the year, of Insects, Reptiles, and Fishes.

109. In animals the analogous changes are shown in the various circumstances connected with the deposition of the ova in insects; and in reptiles, fishes, birds, and mammals, by the phenomena of spawning, incubation, rutting, moulting, and migration.

Many insects, especially the lepidopterous, have a double breeding time; first in the spring, then at the end of summer. In the last case, the colds of autumn arrest the developement of the chrysalis, and it hybernates. In the beginning of spring, just before the period of copulation, and in the autumn, the nervous system of frogs is endowed with a most remarkable irritability. The slightest touch will, at these times, produce the effects of powerful excitants at others; the state of the system resembling that induced by narcotic poisons or tetanus. Among the fishes which are known to spawn twice a year, may be mentioned the salmon and its congeners the red-wrass and the pilchard.

c. Double-breeding and Sexual Moult of Birds.

110. Birds, however, present the best illustrations of the vernal and autumnal movements in animals, for obvious reasons. The double moult of birds, for example, is intimately connected with the state of the generative organs.

Mr. Waterton mentions the following instance, which may be taken as the representative of a large class of facts. A domesticated wild-duck, or mallard, had a brood of ten young ones in May, and on the 27th of October following had another brood of eleven. In the latter end of May the drake begins to moult; by the 6th of July they are like the duck; but by the 10th of October they have got their full plumage again.[w] Swifts migrate in August; Mr. Salmon, however, mentions that a pair which stayed behind the others had a brood in September, which emigrated with the parent birds in October.[x] There was a flight of cross-bills observed at Saffron-Walden, in June, 1835, in different stages of moult; the males being observed to be in full plumage in March.[y] These are all particular instances of general facts. All the anatidæ, the palmipeds, indeed aquatic birds in general, have a double moult.[z] Swifts migrate to Southern Europe, like nightingales, and have there a second brood in autumn. The finches (*fringillæ*) generally have a double moult,[a] as have also the wagtails (*motacillæ*).[b] Cuckoos are amongst our summer emigrants, but if kept in a cage they moult in autumn;[c] and snipes, quails, and godwits, all moult in summer and autumn.[d]

d. Vernal and autumnal Migration in relation with the Sexual Organs.

111. The spring and autumn have some singular relations to the sexes, as regards their developement and migration. The males and females of the humble-bee are produced in September; the neuters, or workers, in May and June.[e] Huber also states that the males and females of the domestic bee are produced only in spring and autumn.[f]

The separation of the sexes in migration is exceedingly curious. The female chaffinches only migrate; the male remains in this country. The rice-bunting, a native of Cuba,

[w] XXIX. viii., p. 544. [x] XXIX. x., p. 108. [y] Ibid., p. 164.
[z] LX. i., pp. 307, 315, 321, 326; also, XXIX. x., p. 310.
[a] XXIII. xiv., pp. 210, 272. [b] LX. i., pp. 232-243.
[c] XXIII. xvii., p. 211. [d] LX. Loco cit.
[e] Huber, in XXXII. vi., p. 264. [f] LXVII. p. 68.

leaves that island in myriads after the planting of the rice in the Carolinas; not a male, however, is found among them.[g] When both sexes migrate, the male generally precedes the female. The cock birds of the ruff, nightingale, and blackcap, are first seen in England;[h] and it is remarkable that the inverse fact has been observed in the migratory movements of other animals. Thus the female salmon and the young salmon or grilse, as well as the female salmon-trout, ascend the rivers in spring before the males.[i] The wild reindeer of North America emigrate in spring and return in autumn, and the females precede the males.[k]

There seems good reason to consider the migration of birds connected with the performance of the generative functions. Dr. Jenner[l] states that it is invariably connected with the size of the ovaries and testes; when these begin to shrink the birds are off; as the cuckoo, whose ovaria are atrophied in July.[m] Müller attributes it to the necessity for a certain temperature;[n] but even the common goose will display various locomotive gambols about migration-time; and if any of our regular migratory birds be kept in an aviary or cage at the period when their species is migrating, they display the greatest uneasiness. Besides, the moult of birds is in close relation with their migration; and how can the summer moult, before alluded to, (110,) be explained? It is exceedingly probable that the procreative condition of the generative organs of animals is, as in vegetables, regulated by temperature; nay, it is possible that the numbers of the sexes born in each year may be dependent upon a similar agency.

e. The Vernal and Autumnal Changes in the Cuticular Appendages of Animals.

112. The changes which are observed to take place in the tegumentary appendages of animals during the vernal and autumnal months are well worthy notice; for although there is no proof that the process of moulting involves changes in

[g] XXI. i., pp. 102, 103. [h] LXII. p. 131. [i] XII. ii., pp. 9, 37.
[k] Richardson, quoted in LXVII. i. [l] XXVII. for 1824, p. 11.
[m] Ibid., p. 27. [n] XIII. p. 90.

the pulmonary and intestinal tubes as in insects, (18,) yet in all cases it is connected with evident disorder of the system. The moults of animals differ in their relations, according to the age of the individual and the season of the year.

113. The first or vernal change is probably sexual in all animals. Spring is the grand period of procreation throughout all animated nature, and it is at this period that the male throws off his winter garb, or assumes his distinguishing characteristics.

At different periods after their escape from the shell, young birds undergo a change in the system, analogous to that in mammals when the teeth are shed, and, like that, it is a period of danger to the immature offspring; it is characterized by a moult, and usually occurs in the summer. In turkeys the change takes place six weeks or two months after hatching, the barbils being at this time developed. The crest begins to shoot in young peacocks when about a month old; the red tint about the head of young partridges, when about three months old; in pheasants the moult occurs about the same age; in canaries at about six weeks. In all these it is a period of danger: young canaries have iron put into the water they drink.[o] Lord Caernarvon found that in his pheasantry scarcely ten per cent. got safely over this period;[p] and similar statements are made by other observers.[q] Young turkeys, according to Buffon, have wine mixed with their food while undergoing these changes.[r]

114. With respect to the summer moult of adult birds it may be observed, that there is a casting of the tegumentary covering in other animals after the vernal effort of the generative nisus: thus spiders are not only subject to the moults which precede puberty, but every spring undergo this change after the exclusion of the eggs.[s] In birds it occurs before the young brood is fully grown, as Mr. Mudie has well remarked.[t] All fish are sickly and out of condition just after spawning, and so are all birds during their moults.

115. The autumnal changes are twofold: first, there is that which is the sequel to the cessation of the generative nisus;

[o] Rennie, in LXIII. p. 73. [p] Ibid., p. 370. [q] XXIX. i., p. 300.
[r] XXIII. xii., p. 125. [s] XVIII. i., p. 215. [t] XXII. ii., p. 268.

and, secondly, that which is little more than a change of colour, consisting apparently in paralysis of the coloriferous organs, induced by cold, and superinduced on the former. These two, however, are very distinct; in the one the feathers themselves are changed, in the other their colour only. The autumnal change in animals is very general. Crabs cast their shell in the beginning of autumn,[u] and serpents their skin. (White.) The lateral spot of the adult sea-bream appears, for the first time, in the young ones (chads) in their first autumn, when they are about half-grown.[v] It may be remarked, that although the greater number of fishes spawn in spring, some spawn in autumn, as the sea-bream. The rutting season of the deer tribe is in autumn. It is scarcely necessary to refer to the autumnal moult of birds, as it is well known to every one. The ovaria and testes are atrophied, and the plumage of the cock bird approximates to that of the hen. Analogous changes occur in mammals. The white spots of the fallow deer (*cervus dama*) disappear with the casting of the coat in autumn, and re-appear in spring, but new hairs are not produced. The wild squirrel also changes his coat and colours in a like manner.

116. The true state of the disputed question whether the change of colour in many birds and animals be dependent on new hairs or feathers or not, is this, in my opinion:—In those animals whose testes and ovaria have only an occasional developement, the male has an appearance resembling that of the female, as in capons, during the period of inactivity. After each period of activity there is a general moult, and a season of inactivity;—the active period occurring in spring and the end of summer, the inactive at midsummer and the end of autumn. After the summer moult, the re-excitement of the reproductive impulse is accompanied by developement of the testes, and the sexual colours and tegumentary appendages are superadded; but after the autumn moult this change does not happen until the spring; and in the meanwhile the cold of winter intervenes, and produces an effect the converse of that following excitement of the generative organs, namely, an absence of colour in the feathers, hairs, &c., of the animal.

[u] XVIII. i., p. 760. [v] XII. i., p. 108.

f. The Vernal and Autumnal Changes in Man.

117. Civilized man is much more protected from the cold of winter than from the heat of summer; but the negation of the stimulus of heat cannot be without its effects: moreover, his reason only enables him to do that without change of climate, which the migratory bird performs by simply winging its way to a warmer region; so that he is still subject as much as they to the influence of the seasons. But if this were not the case, there are other changes in external agencies, occurring at each season, besides a variation of temperature, and which have an effect equally efficacious, but hitherto almost unobserved. Insects begin to seek winter quarters long before the cold of autumn sets in, and even when the season is not so cold by many degrees as it had been during the preceding summer;[w] and their revival is also dependent upon something more than the mere sensation of warmth.[x] The inquiry into these other changes would be misplaced here; it is enough to say that man does not escape their influence. Accordingly, we find the "spring and fall," with the populace, to be seasons of health and disease, and connected with many constitutional changes. Country people even now "bleed and take physic at the spring and fall," and the cutaneous eruptions of these periods are in their opinion evident signs of their great influence. Stoll denounces the autumnal bleedings practised in his time in Hungary.[y] This, like other popular doctrines, has found its way into our general literature.

118. The opinion just mentioned is unquestionably founded upon observation; but it ought not to be concealed, that it may have originated in the domestic habits of our forefathers. A few centuries ago, no fresh meat or vegetables were to be had during the winter; and the people, for six months, were exposed to all the consequences which follow a continued use of salted meat. So soon in spring as the growth of the grass enabled them to eat fresh animal food, and the warmth of the season produced vegetables, there would be the visible consequences of a change from a poor to a more nutritious diet;

[w] XIX. ii., pp. 438, 439. [x] Ibid., p. 456. [y] XLIII. Pars iv., p. 345.

and hence the vernal and autumnal dietetics and therapeutics of the people. It is nevertheless quite certain that there are other and more general influences in operation at these seasons; and, first, with regard to moulting.

119. In the disease of the skin, termed pellagra, which has been classed with ichthyosis, there is a remission, as Dr. Holland informs us, during the autumnal months; but the disease recurs with increased severity in the spring, to remit again in autumn. In the cases of hereditary ichthyosis, or fish-skin, related in the Transactions of the Royal Society, particularly that of the boy aged fourteen,[z] the epidermis was shed every autumn, at which time it was three-fourths of an inch thick. In a subsequent volume,[a] this youth appears as the father of six children; and it is again stated that the epidermis was shed in the autumn or winter months, at which time "he was commonly let blood." A somewhat analogous case of a female is related in the eighth volume, communicated by Mr. Warner. In the Midland Medical and Surgical Reporter for 1829, the case of a young lady, aged twenty, is recorded, whose cuticle exfoliated twice a year, the phenomena being preceded by considerable constitutional disturbance. The cuticle might sometimes be drawn from the hand like a glove.

120. As regards the periodic appearance of certain diseases, the gout (which is in many points connected with the sexual system) appears notoriously in spring and autumn. "Gouty diseases are excited in spring and autumn," is an aphorism of Hippocrates;[b] and Galen confirms it in his Commentary. Van Swieten quotes the following from the Latin version of Lucian's *Tragopodagra*.[c]

> "Sed quando ulmi vere tener flos abundat,
> Et arguta cantat in ramis merula;
> Tunc per membra acutum telum hæret mystis,
> Obscurum, latens, subiens recessus artuum."

Stoll states, "circa æquinoctia et solstitia podagra exacerbari solet;" and this was also the opinion of Baglivi. Insanity is another well-marked disease, which occurs at one or other of

[z] Abridg., vii., p. 543.
[a] Ibid. x., p. 562.
[b] Lib. vi., § 55.
[c] LVIII. iv., p. 289.

these seasons. "Plures vidi," writes Van Swieten,[d] "qui verno tempore per tres vel quatuor septimanas erant maniaci, dum reliquo anni tempore rectè valuerunt." Pinel makes observations to the same effect.[e] Dr. Elliotson had a patient who was periodically insane in March. (Lectures.) Hippocrates enumerates this disease among those which appear in spring and autumn.[f] Of six hundred and seventy-five lunatics admitted into the State Lunatic Hospital at Worcester, Massachusetts, in four years, two hundred and twenty-two, or nearly one-third, were admitted in the spring, and only one hundred and twenty-six in winter. Of two hundred and sixty-nine recoveries, during the same period, ninety took place in autumn, forty-seven in winter, sixty-four in spring.[g] It has been observed, that when chorea recurs in the same individual it is in spring. Other diseases might be mentioned here, as, for example, cutaneous affections.

121. Hypochondriasis and hysteria are most common in autumn and spring, and are best cured in spring,—facts which have escaped all modern writers, but not unknown to the Greeks. P. Ægineta remarks on hysteria, "This affection abounds in spring and autumn."[h] Stoll, whose works are a mine of practical observations, remarks, "Quotquot vidi hypochondriacos et hystericos, circa finem mensis Septembris et majus adhuc Octobris mense, pejus se habuere; paroxysmi graviores, frequentiores."[i] Having come, from my own observations, to the conclusion that hysteria is most common and most difficult to cure in autumn, I felt great satisfaction in finding it corroborated.

122. Do the spring and autumn influence the reproductive organs of man? The Greeks were of opinion that they did. Oribasius, in his Synopsis,[k] quotes from Rufus to the effect that the sexual feeling is most strong in spring, and least ardent in autumn; and Ætius makes the same quotation. This also at the present day is the popular opinion, and appears to be founded in fact; for M. Quetelet states, as the

[d] Op. cit. iii., p. 528. [e] CIX. p. 12. [f] Aph. lib. iii. § 20, 22

[g] Fifth Annual Report of the Trustees of the State Lunatic Asylum, at Worcester (Massachusetts). Boston, U. S. 1838.

[h] Lib. iii., cap. 71. [i] XLIII. Pars v., p. 201. [k] Lib. i., cap. vi.

result of extensive statistical inquiries, that in woman most conceptions take place in May, and fewest in October.[l] Many pathological facts support this opinion. Thus, in a case of nymphomania quoted by Voisin,[m] it is stated, " L'époque de la plus grande salacité s'etendait du commencement à la fin du printemps, et pendant toute cette période la malade répandait une odeur du bouc."

123. The general summary of the facts stated in this section is,—First, that at hebdomadal periods, or their multiples, a change occurs in the system of all animals; and that at puberty, and at each mensual period subsequently, the sexual organs of the female share in this change in common with the whole system; the phenomena resulting being those of menstruation; and that, consequently, the flow of the catamenia is no more than a local effect of the general cause. Second, that the system of all animals undergoes changes about the vernal and autumnal equinoxes, and probably about the summer solstice, in which the generative organs and their dependencies partake; and that the causes of these changes modify in mankind all diseases, but those more particularly connected with the reproductive functions.

[l] VII. xlviii., p. 442. [m] CXXIV. p. 250.

CHAPTER IV.

THE RELATIONS OF THE REPRODUCTIVE ORGANS TO THE NERVOUS SYSTEM IN GENERAL.

124. In all animals there are certain physiological phenomena intimately connected with the reproduction of the species,—as sexual desire, combativeness, and love of offspring; and these give rise to various secondary qualities, as cunning, ferocity, wakefulness.

The excited appetite for sexual gratification is as urgent as that for food under the stimulus of hunger. In both cases the natural ferocity and timidity of animals is increased or diminished with a force and uniformity truly remarkable.

> "Omne adeò genus in terris hominumque ferarumque,
> Et genus æquoreum, pecudes, pictæque volucres
> In furias ignemque ruunt: amor omnibus idem."
>
> Virg. Georg. iii. 242.

125. The propensity to fight is developed in the males of animals with singular uniformity, particularly in gregarious aves and mammalia, as the *gallinacea*, *ungulata*, and *ruminantia*. It has been observed in fishes. The wars of the amorous male salmon, observed by Mr. Shaw,[n] or of the rough-tailed male sticklebacks, in defence of their corner of a tub, as related by another naturalist,[o] might constitute the subject of an epic poem; or its burden might be

> "Quid, quæ imbelles dant prælia cervi."—Virg. Georg. iii. 265.

It is curious to observe how this war among male animals ceases so soon as the developement of the ovulum has com-

[n] CXXX. xiv., part ii. [o] XXIX. iii., p. 329.

menced, amongst those in which the nisus of the generative organs is periodic; while the female, on the other hand, so far from being bold and quarrelsome, is most timid and cautious.

126. One of the most remarkable of the faculties developed during the generative nisus, and peculiar to the females of the higher classes of animals, is their artfulness; and this seems to be given them in place of those weapons of offence and defence with which the males are so generally provided. Indeed the less muscular power, want of defensive weapons, and exalted perceptive faculties of females, would naturally excite into action timidity and cunning. This is strikingly obvious in the human female in general; their sagacity and acuteness being usually remarkable, when well informed. Cabanis, after many interesting remarks on the distinctive qualities of man and woman, emphatically concludes, "Il faut que l'homme soit fort, audacieux, entreprenant; que la femme soit faible, timide, dissimulée."[p]

It is not until puberty, however, that these peculiar qualities of the constitution of woman are distinctly brought out; and in brutes it is only when the business of reproduction is being carried on, that this artfulness is so exalted as to rival the highest attempts of human sagacity. The skill they display in the choice of a secret place in which to deposit their eggs or young, and the finesse with which the latter are protected from discovery or injury, are well known to the most inexperienced student of natural history. The lioness, for example, ferocious and powerful as she is, when she fears that the retreat in which she has placed her cubs will be discovered, will hide her footmarks, by retracing the ground or brushing them out with her tail.

127. Another remarkable effect of the change in the system at large, induced during the performance of the reproductive functions, is a loss of appetite or cessation of its indulgence. Indeed some insects, as male butterflies and moths, have no masticatory organs whatever; while many of the females never eat during the whole process of incubation. Hen birds, during the same season, become exceedingly lean for

[p] LIII. i., p. 294.

want of food; and after the brood is hatched there is still a remarkable cessation of the appetite in favour of the young ones. During the rutting season stags and others of the class are scarcely ever seen to eat for the whole time of its continuance. The influence of physical love on the appetite of men and women is a matter of daily observation.

Bulimia, pica, and strange longings are morbid modifications of the appetite, and belong to the same class of phenomena as the anorexia just mentioned, and, like it, are characteristic of the pregnant, chlorotic, and hysterical female.

128. Reference at some length has been made to the connexion between certain products of the skin, namely, odours, colours, horns, crests, &c., and the sexual organs; now the effect of these on the mind ought not to be overlooked.

And first, as regards the sexual odours, in addition to the remarks previously made. (25.) The perception of the generative odours creates frequently in brutes an excitement bordering on fury,—the timid becoming bold, and the bold ferocious. The influence of scents on the passion of love has been made the subject of special inquiry by Virey; has been acknowledged by several writers of repute; and has been made available in the composition of philtres and aphrodisiacs. The fact is one too glaring to escape general observation. (27.) Virgil embodies it in those beautiful lines from which I have already quoted,—

> " Nonne vides ut tota tremor pertentet equorum
> Corpora, si tantùm notas odor attulit auras?"
>
> Georg. iii. 249.

129. With respect to the colour and form of the sexual tegumentary appendages, it cannot be doubted that the magnificence of form and brilliancy of colour of many cock birds must have some influence upon the female, since colour and form may, and actually do affect the mind, as much as odours and sounds. Indeed, Buffon makes the following remark: " If hen canaries be entirely separated from the cock birds, so as not to see or hear them, they very seldom lay; but oftenest drop their eggs when melted by the song or view of

the males."[q] The external appearance of the sexes, especially in regard to the tegumentary appendages, the beard and mammæ, has an undoubted influence on mankind; and no circumstance, in the caricature of humanity displayed by the monkey tribe, is more disgusting than that of the male giving evidence of sexual excitement at the presence of the human female.

130. The uniform developement of the organ of voice of male animals, contemporaneously with that of the testes, and connected therewith, the various facts stated previously (59) will necessarily lead the reader to the inquiry whether music has any influence on the female? The reply must be, I think, in the affirmative. To the observation of Buffon, just quoted, may be added that of Montagu, to the effect that as soon as the hen bird has hatched her brood the cock ceases to sing; but if either they or the hen bird be destroyed, he recommences his song.[r] Mudie's ideas on the subject are yet more explicit: "We can observe that the females of all birds are excited by the sexual cry: it may be that it produces in the female that heat which is necessary for hatching the eggs."[s] Again, "It seems to me that the song and attentions of the male are necessaries in aid of the warmth of the season to produce the sexual movement in the female bird."[t] The action of the same law is perceptible in man in the effects of the music and dance of the ball-room, and in the poetic fury with which some men are affected for the first and last time of their lives during the season of courtship,—wooing

> "With woeful ballad
> Made to their mistress' eyebrow."

Indeed, it is an observation of Lacon, confirmed by daily experience, that "love makes many rhymers, but few poets."

131. Lastly, it may be remarked that the whole nervous system is excited by the sexual stimulus, as much as by opium or other powerful nervine alteratives. This fact has been already stated with respect to frogs (109); it is obvious in

[q] XXIII. xiv., p. 95.
[r] LXIII. p. 476.
[s] XXII. i., p. 245.
[t] Ibid. ii., p. 29.

women, especially in cases of nymphomania, when the system has become endowed with all the irritability observed in hydrophobia; the slightest touch (as in frogs) inducing tetanic spasms. In satyriasis, the symptoms are somewhat analogous.[u]

Many of the facts stated in the preceding sections will be found to have an important bearing on the diagnosis and treatment of the diseases to be considered; while others are not less necessary to elucidate comprehensively their pathology. A few are mentioned to excite a spirit of observation and inquiry, and I hope the reader will be led from these considerations to tolerate the apparently unnecessary diffuseness in which I have indulged.

[u] My Essay in VII. li., p. 319.

CHAPTER V.

THE MENTAL AND CORPOREAL PECULIARITIES OF WOMAN.

a. The Affectability of her Nervous System.

132. Without preface it may be stated, that by universal consent the nervous system of the human female is allowed to be sooner affected by all stimuli, whether corporeal or mental, than that of the male. This susceptibility of woman, and her less mental and muscular power, are known, indeed, by daily observation. Poets, whose duty it is "to hold the mirror up to nature," have not overlooked them. The great Roman dramatist has put on record the mental character of the women of his day:

> "Mulieres sunt fermè, ut pueri, levi sententia;
> Fortasse unum aliquod verbum hanc inter eas iram conciverit."
>
> P. Terentii, *Hecyra*, Act. iii. Sc. 1.

Tasso, with a bitterness warranted, perhaps, by his own sufferings, declares,

> "Femmina è cosa garrula e fallace,
> Vuola e disvuola; è folle uom che sen fida."
>
> Gerus. Liber. Canto xix. St. 84.

Indeed such sentiments as these have become proverbial; but if the susceptibility of woman be a cause of her frailties, it is equally efficacious in giving lustre to her virtues; compassionate kindness, piety, honest sincerity, and constancy, appearing with the greatest perfection in the sex. The term affectability has been applied by Morelle to the constitution of woman, and it is both comprehensive and expressive.

b. Peculiarities in the Configuration of Woman.

133. Although in the preceding sections I have dwelt forcibly upon the dominant influence of the ovaria and testes on

the system, I am by no means willing to allow that they are the sole cause of the distinctive peculiarities of the sex. (16.) For instance, according to Autenrieth, Sömmering, Meckel, and Velpeau, there are certain distinctive peculiarities in the size and general conformation of the sexes, observable in the early months of fœtal life, such as the particular structure of the thorax and abdomen, the form of the head, the extremities, and the dorsal spine,[v] before there is any perceptible difference in the sexual organs; the ovaria and testes being up to the eighth week exactly alike. And at a more advanced period of developement, when these and the other generative organs have attained their proper position and peculiar form, but as yet exert no perceptible influence on the system at large, a marked difference between the sexes may be observed. M. Quetelet has drawn up tables which illustrate very well the difference in the weight and height of the two sexes at various ages; I shall only state the comparative weights.

	lb. avoir.		lb. avoir.
At birth the male weighs	7.05	The female weighs	6.41
At one year of age . .	20.84	. . . . .	19.38
At five years of age . .	34.78	. . . . .	31.67
At twelve years of age .	65.76	. . . . .	65.76
At fifteen years of age .	88.69	. . . . .	89.03
At thirty years of age .	140.37	. . . . .	121.80

And in a corresponding ratio to the age of ninety years.[w] This table shows also the effect of the earlier accession of puberty in the female, giving her the superiority between the ages of twelve and fifteen. Tiedemann states, that the difference of weight between the male and female brain, which in adults averages from four to eight ounces, is already perceptible in a new-born child.[x]

It is commonly stated that there is little difference in the general appearance of the sexes before puberty. This may be true with regard to the period of infancy; but a single glance at an assembly of boys and girls of various ages, from two to ten years, will convince the observer that there is more

[v] LVI. p. xi. [w] Edin. Phil. Journ., 1834. [x] XXVII. for 1836, Pt. ii.

harshness of outline, greater proportionate magnitude, and a less delicate expression of countenance in the boys.

134. Between male and female animals deprived of the organs of generation, a marked difference in the general conformation may also be observed. The ox attains a magnitude far greater than that of the spayed heifer. The following is, perhaps, a better illustration. In a litter of twelve or fourteen pigs of different sexes, littered at the same time by the same sow, and mutilated at the same early age, we have all the most essential circumstances exactly alike. Yet the *gelt* hog, or castrated boar, is readily known from the *gelt* pig or spayed sow, by his larger limbs; a difference well known to the butcher, who says the latter is "more *bloody*," that is, has smaller bones than the former. The removal, or non-developement of the testicles in man, by no means checks the growth of the system in general. A case of the latter kind, proving this statement, which came under my own observation, I have related elsewhere.[y] Dr. Oppenheim did not find the mental faculties of the eunuchs in the Turkish harems at all depraved, as is generally supposed to be the case; nor are their height and strength inferior to those of other men, if well fed and free from mental disquiet.

135. It would appear then from these facts, that the opinion of Cabanis is well founded, which is, that the peculiarities of the sexes, whether mental or corporeal, including those referred to the generative organs, depend upon some particular organization of the primitive nervous system.[z] According to Geoffroy St. Hilaire, Serres, and other continental physiologists, the developement of an organ in the embryo has some direct ratio to the amount of nervous matter contained in it. Meckel, and some of the German transcendental physiologists, assert with G. St. Hilaire, and Blainville, that woman is but an imperfectly developed male; the primary formative nisus not being sufficiently powerful to carry the individual through all the phases of masculine developement. Yet this doctrine does not assert that woman is an inferior or imperfect being; but simply this, that a more energetic nisus would have so influenced the general system, that the bones and muscles would

[y] VII. l., p. 28. [z] LIII. i., p. 282.

have attained the masculine size, and the ovaria would have been testes, with all the special points of sexual difference dependent on the latter.

c. The Vascular System of Woman.

136. In the present state of the science of embryology, we have no opportunity of tracing this general law just mentioned throughout its relations, and ascertaining those connected with the pathology of nervous diseases. Clearly the less or greater magnitude of the nervous system presents nothing tangible for consideration. Pathology, however, in the hæmorrhagic diathesis of the hysterical, points out an available starting point in the vascular system. In all females during the mensual nisus, when there is an exalted affectibility of the whole system, and in the ovarian system in particular, the blood-vessels of the uterus assume a state like that observed in the whole vascular system in hæmorrhagic hysteria, and pour out the colouring matter of the blood, together with the proper uterine secretion. The monthly flow of blood from the urethra and rectum of some males is of a similar nature, and was treated of by the older writers as a disease peculiar to men with a feminine system.

137. Following up the clue thus afforded, we are led to a singular set of pathological phenomena, which seem to indicate that the law of developement just alluded to, modifies not only the nervous, muscular, and osseous tissue, but also those of the whole vascular system. From time to time a hereditary diathesis has been observed in families, but peculiar to the females; and an individual possessing it has been invariably found to be liable to the most dangerous hæmorrhages upon the slightest solution of continuity, as the puncture of a pin, or of the vaccinating lancet, or any trifling injury of the surface. It is of importance to observe, that the females of these families (with two exceptions) are invariably free from the fatal diathesis. Their male offspring, however, will certainly possess it, while their female children, like themselves, will escape. And it is of importance to observe that the males, or "bleeders," as they have been termed, exhibit the influence of the diathesis while infants, and con-

sequently long before the sexual organs could have influenced the system. The two exceptions mentioned, were observed by Dr. Elsässer, and in these females ecchymosis was observed during youth only.[a] With these facts before us, it is impossible to avoid the conclusion that the same condition of the system which determines the sex of the embryo, determines also the hæmorrhagic constitution of the male, and prevents its developement in the female; and also, as a corollary, that the condition of the system which determines the sex, in some way unknown, influences the vascular system.

d. The Composition of the Blood of Woman.

138. Turning from the anatomical composition of the vascular system to its contents, we shall find that the ratio in which the various constituents of the blood enter into its composition is worthy of notice, as having an intimate relation with the affectability, whether natural or morbid, observed in woman. In a great proportion of the cases of hæmorrhagic hysteria the blood has a loose crasis, arising apparently from a deficiency of fibrin. Now blood-letting will of itself produce this condition. Prevost and Dumas having bled a cat largely, found one thousand parts of its blood to consist of seven hundred and ninety-one of water, eighty-seven of albumen, and one hundred and eighteen of globules. Two minutes afterwards they repeated the bleeding, and found the water increased, and the solid particles diminished in quantity; and after another interval of five minutes, the bleeding was repeated for the third time, and they found the blood to consist of eight

[a] Hufeland's Journal, Feb. and Sept. 1824. The following list of references to cases and monographs will be found more complete than any yet given, and will be useful to those who may desire to investigate this curious subject. Edin. Med. and Surg. Journal, xix., xxv., xxvi., xxxii., xxxvi.—London, Med. and Phys. Journal, xx., xl., lx.—New Lond. Med. and Phys. Jour. vii.—Dublin Journal of the Med. Sc. vii.—Mr. Wardrop's Work on Blood-letting.—Horn's Arch. für. Med. Erfahr. 1820.—Rust's Magasin, xxvii., Bd. ii., 1828.—Zeitsch. für. Nat. and Heilk. v., Bd. ii.—Arch. Gen. de Med. Series ii., Tom. xiv., Ser. iii., Tom. i.—Suisse Gaz. Med., 1838, No. iii.—Ripp, Untersuch. in Betreff. der Anlag. zu todl. Blutungen, Frankfurt, 1835.—Schönlein, Allgem. und Spec. Pathologie, Bd. ii.—Nachricht von Zwei Blutern, von Dr. Schreyer.

hundred and twenty-nine parts water, seventy-seven of albumen, and ninety-three of globules. Le Canu obtained similar results from the analysis of human blood, taken from patients who had been bled to a large amount, or were labouring under hæmorrhagic affections.[b] These experiments are of importance when connected with the phenomena of hysteria and of excessive depletion.

139. It ought not to be overlooked, that, according to Denis and Le Canu, who made an extraordinary number of observations, the blood of women in general contains more water and less crassamentum than that of men. Le Canu found the quantity of water in 1000 parts of the blood of females to vary from 790.394 to 853; of males, from 778.625 to 805.26.[c] Denis examined the blood of twenty-four men and twenty-eight women, and the mean result of his experiments was, that the proportion of water in the blood of males and females is as 767 to 787.[d] Denis found also a greater proportion of water in the blood of aged persons and children. According to Le Canu, the blood of men contains, in 1000 parts, about 32.98 more of the components of the crassamentum than that of women. If these observations were extended so as to comprise an analysis of the blood of females constantly exposed to the open air, and in robust health, with the same results, they would go far towards elucidating some obscure points in the characteristics of the sexes, and the pathology of hysterical affections. At present, however, we can only infer that the blood of females living in towns,—for such I presume were the subject of Le Canu's researches,—presents these peculiarities; and that the blood of females in general is more easily affected by the depressing agencies of crowded societies. It should be stated, that the last-mentioned physiologist found the quantity of crassamentum diminished in the blood of women during the time of menstruation, a fact in some degree corroborated by the observations of Solano de Lucque, and subsequently by those of Van Swieten[e] and Bordeu,[f] on the peculiar pulse of menstruating women. Magendie found the excess of serum

[b] XVIII. i., p. 413. [c] XIII. p. 119. [d] Ibid.
[e] LVIII. iv., p. 419. [f] XXXIV. Obs. xxx., &c.

very remarkable in the blood of a young hysterical female, and in another affected with leucorrhœa.[g]

140. The connexion between the affectability of the human female, whether at or between each mensual period, and a deficiency of fibrin or crassamentum in the blood, is farther illustrated by the exceptions to the general principle upon which this section is based, namely, that hysterical affections are peculiar to females. Hysteria most unquestionably occurs in men occasionally. Louyer Villermay, and some of those authors who place the disease in the uterus, necessarily deny this; but the fact is established by a host of observers: Piso, (or Le Pois,) Willis, Sydenham, Boerhaave, Cullen, Ferriar, Mackintosh, Johnson, Conolly, Brodie, M. Hall, and others, have observed hysteria in men. I think I have seen four cases. Of these, two were fat, pale-faced, effeminate-looking men; in the one the affection was attributed to malaria, and he had flabby wasted testicles, with very scanty secretion of urine, globus, borborygmi, colic, and paralytic affection of the arm. The third case was that of a boy, pale and delicate, aged fourteen. He had paroxyms of violent palpitation and dyspnœa occurring regularly every night, for two or three weeks together. To these were added delirium, amounting sometimes to furious mania, spectral illusions, cephalæa, diminished secretion of urine, pain in the loins, constipation, and more particularly that almost diagnostic symptom, an unconquerable dislike of animal food, especially of beef and mutton, the smallest portion of which would make him vomit. He recovered as he approached puberty, relapsed on being confined to a shop in Leeds, but ultimately became quite strong. The fourth, a youth, had globus, &c.

141. As the nervous diseases of females occur, or are aggravated, at hebdomadal or mensual periods, so lunacy, epilepsy, and epileptiform hysteria, occur at similar periods in men, and depend on the same exciting causes. The hysteria may also be dependent on a feminine general system, or on depletion and hard study about the period of puberty, or on malaria; in short, upon any of the causes which originate or increase the affectability of the human female. But the most

[g] XXX. i., 1838-9, p. 285.

fruitful sources of hysteria and hypochondriasis are those agents which act injuriously on the blood, as well as on the nervous system. Diseases of mucous membranes, want of muscular exercise and of due exposure to the atmosphere; improper food, vicious habits implicating the sexual organs and debilitating the system, and excitement of the brain and nervous system in general, however originating, all operate, probably, by reducing the blood to a state similar to that of the hysterical female. Analogous to the effects of these are the changes produced in the blood by depletion, (as has been already shown,) also during the spasms of spasmodic diseases, as tetanus and epilepsy; by certain mineral poisons, as arsenic; by animal poisons, as in rabies, and from the bites of venomous reptiles; by narcotic and acro-narcotic vegetable poisons, as opium, strychnine, brucia, &c., the symptoms of which strongly resemble those of hysteria; and, lastly, by the agency of the excited generative system.

142. As a general summary, it may be stated that, concurrently with the natural affectability of women in health, there is a looser crasis of the blood than in man; and that the morbid affectability of the system upon which the nervous diseases of woman are grafted, is caused and kept up by any agencies which increase this peculiarity of the blood, as those enumerated in the preceding paragraph. On the other hand, moderate exercise in the open air, good plain food, simple habits of life, and tonics,—in short, all those remedial agents which serve to restore the blood to its healthy condition,—will remove this morbid affectability.

In concluding these very general remarks on the peculiar constitution of woman, I should wish to limit my observations to those females who in general follow sedentary occupations, and suffer from repressed feelings in civilized communities. I simply contend for the existence of this affectability in women so placed, as being connected with a peculiar condition of the blood. In them, it may be compatible with general good health; but in man it is a morbid state, the source of hypochondriasis, and the result of causes which depress the assimilating powers, or excite unequally the nervous system. Those causes which excite it in the male will

exalt it in the female, and we have then the morbid sensibility before mentioned. The great demand made at puberty upon the assimilating organs to which the supply is unequal, and the rapid evolution of the nervous system, whether as subservient to the function of generation, or to mind, are manifestly influences of a depressing character. At that period, and afterwards, the influence of the sexual system is predominant, and the organs under their influence will be the first to suffer from any causes which depress the system at large, or excite the generative organs in particular.

143. It is clear, however, from these statements, that the vascular, no less than the nervous system, is implicated in hysterical disorders; and it is equally obvious that the term hysteria is singularly inapplicable, and the term nervous diseases altogether vague. Perhaps a good general term for the whole class of hysteric and hypochondriacal diseases would be *neuræmia*, (νεῦρον and αἷμα,) and *neuræmic*, being distinguished from organic diseases of the nervous system in this, that in the latter it is not so much the blood, as the blood vessels, which are diseased, as in paralysis, apoplexy, &c.; thus *neuræmic* neuralgia would be distinguished from the real tic-douloureux dependent on organic disease. It is true, one class passes insensibly into the other; but this happens in all classifications of vital structures and functions.

CHAPTER VI.

SOME POINTS IN THE METAPHYSICS AND PHYSIOLOGY OF THE NERVOUS SYSTEM CONSIDERED.

144. The last general principle to be noticed is that which places these affections in the nervous system. It may probably be thought that a reference to our systematic works on the physiology of this system might serve our purpose, or that its relations might be considered in connexion with the pathology of disease. But there are some general views not specially set forth in systematic works, but specially connected with our subject, the consideration of which will assist the practitioner in acquiring such a knowledge of the general theory of the diagnosis, pathology, and treatment of the nervous diseases of women, as will be of the most efficient use at the bedside, at a time when set rules fail to assist him in his perplexity. They will also afford matter for thought, and rallying points for a thousand stray facts connected with a most curious class of diseases, which singly would be valueless, but when arranged around these and considered unitedly, will assuredly advance both the sciences of medicine and physiology, whether the principles themselves be true or false.

145. It is scarcely a quarter of a century since Sir C. Bell and others demonstrated the distinctness of the motor and sentient nerves, and it is only within the last three or four years that the attention of the profession has been fairly directed to the doctrines so perseveringly and successfully advocated by Dr. Hall. There are, however, numerous observations which, when compared, serve to extend the two great doctrines above alluded to, far beyond their original limits; placing on the one hand the sensorial fibres under the power of the will; on the other, applying the laws of the excito-motory system to the phenomena, not of the spinal cord only and its

prolongations, but to the brain also, and the diffused nervous system. Such a large and comprehensive view is necessary for the advancement of our knowledge; but difficulties almost insuperable are in the way, arising from the extent of the phenomena to be investigated, and the still greater extent of their relations, relations which stretch on the one side into the dim regions of metaphysics, on the other into the illimitable space of the physical sciences;—the investigation being entangled, in addition, with a hundred theological questions, themselves involved in doubt and obscurity.

146. As in the course of this inquiry I shall unavoidably be led from the consideration of facts, into various unsatisfactory hypotheses and speculations, I must at the outset solicit the indulgence of the reader, and request that he will consider them as nothing more than instruments of investigation, no more to be compared with truth, than the spade and mattock with the gold they assist in discovering. Hypotheses may be considered the scaffolding of the arch of science,—at the best a complicated and confused structure, built to be knocked away when the key-stone is driven home.

Disordered innervation is manifested by interruption or derangement of secretion, motion, sensation, and thought. Sensation and thought are so intimately connected with consciousness, that to this we must first direct our attention, not less to smooth our path, than to limit its extent.

147. Perhaps no subject has engaged the attention of man so much as the nature of his own mind, and certainly none affords a wider scope for the exercise of his powers. Placed, as it were, between heaven and earth, and connected with both, the inquiry into the nature of the human mind stretches far into both. Man goes from his own existence to that of the Deity, from this he reverts to matter, or from matter ascends to the brute again to return to the consideration of himself. The maze has been repeatedly trodden, and as often with the same result; and thus it is that the theories respecting organization, life, the soul, the Deity, a future state, have all so remarkable a similarity,—and this, whether they be those recorded in oriental literature, and extant at a period when the Greeks were mere savages,—or those con-

tained in the disquisitions of Pythagoras, Plato, and Aristotle; in the metaphysical commentaries of the middle ages, or in the physical speculations of the moderns, founded on gravitating, electric, magnetic, attractive, and repulsive forces. They all present more or less prominently, three essentials, namely, intelligence, force, and inert matter.

148. Nor have these essentials been confined to philosophers;—the popular metaphysics of every age have been tinctured with them. The early Greek writers derived their opinions from the East; and the moderns are equally indebted to the same source, through the Holy Scriptures, the language of which is imbued with the popular philosophy of the æras at which they were severally written. St. Paul purposely embodied the essence of the Platonic philosophy in that celebrated passage in his sermon to the Athenians:—"For in Him we live, and move, and have our being." Ἐν αὐτῷ γὰρ ζῶμεν, καὶ κινούμεθα, καί ἐσμεν. The Greek scholar will see at once that the true meaning is not exactly rendered in our translation, it being rather that from the Supreme Being we derive consciousness, (ἐσμέν,) force, (κινούμεθα,) and animal life (ζῶμεν).[h] So Aristotle, in his treatise Περὶ Κόσμου, writing of the cause which keeps the universe together, observes that according to an ancient tradition which has been transmitted to every tribe of the human race, all things have proceeded from God, and are every moment dependent upon him for their continuance and mode of existence.[i]

149. This opinion taught by Plato and Epicharmus was derived from the Védánti school of India, the fundamental tenet of which was, that solidity, impenetrability, and extended figure, depend upon a continued effort of the Divine energy; and, consequently, the secondary qualities of matter derived from these the primary qualities.[j] In modern days Sir I. Newton has supported the opinion that gravity was the primary force of the universe, and dependent upon a

[h] As a further illustration of his argument, St. Paul quotes from the poet Aratus,—Τοῦ γὰρ καὶ γένος ἐσμέν—"For we are His offspring."

[i] LXX. p. 430. [j] LXXI. ii., note B.

continued volition of the Creator. Dr. Clarke expressly states, "All those effects which we commonly say are the effects of the natural powers of matter and laws of motion, of gravitation, attraction, and the like, are indeed (if we will speak strictly and properly) the effects of God acting upon matter continually, and every moment," &c.[k] Dugald Stewart, too, concludes, that "matter is not a thing which has a separate and independent existence, but an *effect* which is continued by the constant agency of Divine power."[l]

150. The great first cause of cosmological phenomena has been confounded continually with its effects; and men have philosophized until they erected that into a deity, which is but an instrument of the Supreme Mind. Fire and light, the grand representatives of the force necessary to set in motion all vital mechanisms, were worshipped at an early period in the East. Hippocrates, in expressing not only his own sentiments, but those also of Heraclitus, and many of the Stoics, says, "It appears to me, that what is called heat, the elemental fire, is immortal and omniscient; that it sees, and hears, and knows all things, present and to come."[m] Heat has been considered the animating or vital principle. Cicero quotes Lucilius Balbus as maintaining that whatever lives, be it animal or plant, lives by its *calor inclusus*.[n] Harvey attributed life to an animating principle, a *calidum innatum* in the blood, totally different in its operations from ordinary heat, and analogous to the element of the stars.[o]

151. According to Diogenes Laertius, Anaxagoras the Clazomenian was the first who considered mind as well as matter to be a primary independent principle; commencing his work with this remarkable observation,—"All things at first existed together in a state of confusion; mind then came and arranged them" (διεκοσμησε). He maintained also, that mind was the cause of motion: "νοῦν μὲν ἀρχὴν κίνησεως."[p] Analogous, but more specific, are the doctrines of that remarkable and

[k] Works, folio Edition, ii., p. 698. [l] LXXI. ii., p. 188.
[m] LXX. p. 82. [n] De Naturâ Deor. lib. ii. § 9, 10, 15.
[o] LXXII. Exercit., lxx. [p] LXX. p. 37.

ancient system of cosmogony which constitutes the introduction or proemium of the Mosaic writings, and is illustrated so beautifully by both geology and transcendental physiology. Moses simply declares, "God said, Let there be light, and there was light." Now the word in the original here translated "light," does not alone mean the light of the sun, or of a luminous body, but rather the cause or essence of both light and heat; corresponding in fact to the "fire" of the ancients, and "caloric" of the moderns;[q] caloric being now considered by many,[r] and I think correctly, as nothing more than a modification of the primary forces of matter, (149,) or of those powers of repulsion which, according to the theory of Boscovich, are attached to unextended elements to constitute matter itself. The essentials of the theories of Aristotle, of Leibnitz, and of the French neo-platonic school, are the same. La Place's cosmological theory is exactly similar to the Mosaic, so far as it is developed.[s]

It is to be regretted that the physiology of the mind of man is made still more difficult to study by speculations on the immortality of the soul. The knowledge of the existence of God, of ourselves, and of matter,—of a future state, of right and wrong, and of moral liberty,—are inherent in our nature; and if they were not confirmed by revelation, ought no more to be questioned than mathematical truths. No inductive arguments can render our perceptions of them clearer, or throw a stronger light on these abstruse subjects. Nor would I have entered at all upon the consideration of them, had it not been absolutely necessary to understand clearly the point at which we may safely commence our inquiries about things *as they are*.

152. It is certainly both reasonable and philosophical to assume that there is an agency in man (and for anything we know in other animals) distinct from matter and organization, but dependent upon organization for the due display of its effects. There is no necessity to inquire into its essence, origin, or future state, in the present stage of our inquiries.

[q] A. Clarke's Comment. [r] LXXIII. passim.
[s] Edinb. Rev. lxxviii., p. 297.

This is the sum of our knowledge: mind ascertains the existence of matter by its qualities, which are dependent on force; force could not have existed without mind (151); finite minds could not exist nor perceive the existence of matter if there were no force; matter without mind or force would be inert or essentially nothing. Again,

153. Mind is that which originates motion, or wills; perceives the qualities of matter; and compares the perceptions, or thinks. Or, in the words of D. Stewart, that which feels, which thinks, which has the power of beginning motion.[t] Grew's definition of life displays great profoundness of thought: "Yet neither by life, nor the subject of it, do I mean a principle of motion;—the universal stock of motion, as that of matter, being neither increased nor diminished, but only transferred;—but I mean a certain power to determine the manner of its being transferred," &c.[u] The will, to originate motion, must be able to act upon matter so as to change the relation of its forces. It appears as if the finite mind is to its corporeal organs, what the Infinite is to the universe; "princeps ille Deus qui omnem hunc mundum regit, sicut animus humanus id corpus cui præpositus est."[v] There is, however, this remarkable difference, namely, that the Supreme Mind originates force, while the finite only transfers it, for so it excites motion; the former originates the qualities of matter, the latter can only feel their effects on organized matter: the Divine Mind thought before matter existed; we think with our brains.

154. In assuming the power to will and perceive changes in matter as the efficient cause of mind, it is not necessary to decide whether this efficient cause can exist independently of the brain or not; but in this world we can know nothing of it, except as manifested by its effects on the brain, and through the brain on the nervous system, the muscles, and the external world. By these effects, and by our consciousness, we are assured of its actual present existence:—by our own consciousness, because we are as sensible of the power to will

[t] LXXI. i., notes, p. 401. [u] LXXV. p. 65.
[v] Cicero, Somn. Scip. § iii.

and perceive, as we are of the action of light; (and it would be equally rational to deny the existence of the one as of the other;) by its effects, because motion plainly follows volition; or, in the words of Locke, "sensation convinces us that there are solid extended substances, and reflection that there are thinking ones; experience assures us of the existence of such beings, and that the one has power to move body by impulse, and the other by thought."[w] In short, the will exerts a force on organized matter—the brain, in exciting motion, as plainly as the force of matter acts on the nerves in exciting sensation. The effects of these forces on matter constitute the legitimate objects of scientific research.

155. The field of inquiry embraces the whole of the physical sciences; the aim and end of these being the discovery of the laws regulating the motion of matter under different forms, whether solid, fluid, or gaseous; imponderable, molecular, or in mass. The most superficial observation has rendered it certain, that the effects of both psychical and physical force on the phenomena of life, are manifested through a complicated apparatus only to be thoroughly understood when the physical sciences can be applied unitedly to the investigation. Where then shall we begin?

156. Molecular motion is that which principally concerns us; and it may be stated, *in limine*, that it is by the molecular re-action of gaseous and solid matter upon each other, that the greatest amount of force or impulse is developed. In solid matter the particles are compelled to occupy less space by what has been called the force of cohesion; in gaseous matter they are supposed to be repelled from each other by a repulsive force which is eliminated or set free whenever the gaseous matter becomes solid. The atmosphere may be considered the grand repository of this force. From the sensation it excites when acting on a living body, it has been called heat, or the matter of heat. Separating the particles of water from each other, it produces steam, varying in expansive power according to the amount of repulsive force or heat acting upon its particles. If the supply of air be cut off from

[w] LXXVII. Book 2, chap. xxxiii., § 28, 29.

the furnace of the steam-engine, mutual decomposition of the atmosphere and the fuel is arrested, heat is no longer evolved, and the motion of the whole machinery connected with the boiler is stopped. So also, if the air be excluded from the galvanic battery, decomposition ceases at the poles, gaseous matter is no longer evolved, the weight drops from the helix, nor can light be produced.

157. Not less important is the atmosphere to the due performance of vital mechanism; it is absolutely necessary to its existence; and in animals the amount of temperature and capillary and muscular motion will always bear a distinct ratio to the consumption of atmospheric air; or, in other words, the respiratory apparatus will always have a magnitude proportionate to the vital movements of the individual; indeed, no organism can exist without an apparatus for the mutual action of solid and gaseous matters. In plants, the leaves and roots are the organs fitted for this purpose, and correspond to the lungs and stomach of animals.

158. If we would obtain a large and definite knowledge of the action of force upon matter and intelligence, in exciting the phenomena of life and thought as displayed in man, we must examine the laws of its action, as exhibited both in every living organism, and in the molecular changes of inorganic matter. A thousand circumstances assure us, that between these last and the highest efforts of human intellect, there is a continuous chain of phenomena, although we are unable to follow it link by link. "La sensibilité se rattache, peut-être, par quelques points essentiels aux causes et aux lois du mouvement, source générale et féconde de tous les phénomènes de l'univers," is the comprehensive remark of Cabanis.[x] The links of this chain are so continuous between certain vegetables, and animals of the lowest class, that naturalists have been unable to decide whether the organism should be placed in the animal or vegetable kingdom. And even when there can be no doubt of the nature of the individual, circumstances still show forth the similarity of the laws by which all organisms are governed. Thus in plants we find the

[x] LIII. Mem. ii., § iii.

male and female organs in the same individual constituting a true hermaphrodite; in animals which have the male and female organs in one individual, the congress of two individuals is necessary for reproduction, provided they have the power of locomotion; but if they be fixed, as the acorn shell-fish, then they become true hermaphrodites, and impregnate themselves like plants.

159. In a practical treatise, any thing like a systematic attempt at demonstration of the close connexion of organic matter would be somewhat misplaced and necessarily imperfect; but from the preceding general views, it may be readily inferred, that no bio-molecular movements take place, even in animals of the highest organization, which have not their counterpart in vegetables, and in animals of the lowest forms. The following hasty sketch of the more prominent features of the animal scale will be useful.

160. In vegetables, and in the beings of analogous organization, being those at the foot of the scale, there is no central nervous system. The nutritive and respiratory functions are carried on by powers originating in, and connected with, a mechanism diffused through the tissues of the organism; so that a leaf, or a portion of a polypus or planaria, possesses, independently of the parent being, the essentials to continued vital action, namely, a respiratory and a nutritive apparatus. (157.)

If we advance a step higher, we find a distinct nervous system, having a centre of action (a ganglion); and exactly as is a plant, so may an individual animal be, really a congeries of individuals; each segment or ganglion with its dependent tissues having a power of maintaining a continued and independent existence when separated from the others. Thus Dr. Grant remarks, "As each segment of the tænia is complete in itself, and capable of independent existence, so each segment of the body throughout the helminthoid classes may be viewed as a separate being, with its exterior covering and its muscles, its vascular and digestive apparatus, its brain and its nerves of motion and sensation."[y] Illustrations of the

[y] LXXVIII. ii., p. 487.

general fact may be derived from sections of other annelida, as the nereides and naiades.

161. In the next grade of animal developement we find, that just as the diffused nervous system became dependent upon a central ganglion, so these various ganglia, hitherto almost independent, are now become dependent upon some one or two which have attained a developement superior to the rest, and which are essential to the integrity of the functions of the whole. These more important ganglia are subservient to the nutrition of the whole system; respiration is still diffused, and when the ganglia are separated from each other, the tissues connected with them will still present vital movements, the intensity and duration of which will be always in proportion to the power of nutrition and respiration possessed by the segment, and to the amount of force required for their continuance.

It is thus that portions of articulated animals (as insects) which have a large respiratory apparatus diffused through the body, display vitality long after mutilation; it is thus, also, that segments of certain cold-blooded vertebrata,—as the salamander, frog, and turtle,—display such remarkable tenacity of life. In these we have various circumstances favourable to continued vital action:—1st. The vital movements can go on at a low temperature, so that force is not expended in keeping up the heat of the vital mechanism; nor is its action impeded when the heat is diminished, as in hot-blooded animals. 2nd. The skin is a respiratory organ; and probably the dermis, and even the moving tissues themselves, will act upon the atmosphere long after the proper respiratory apparatus is destroyed; for it appears that the tissues of cold-blooded vertebrata are specifically different from those of the hot-blooded, and probably analogous to the corresponding structures in cold-blooded articulata, and animals with a diffused nervous system. Cuvier was partially right in asserting that the irritability of muscles is directly proportioned to the quantity of air the animal consumes; but the proposition is not so simple, for the irritability of the muscles of cold-blooded vertebrata may continue at the temperature of the surrounding atmosphere; whereas those of the hot-

blooded require force from the atmosphere, not merely to move the fibres, but to keep them at the temperature necessary to motion.

162. In the hot-blooded vertebrata the ganglia are more centralized, the whole of the vital mechanism requires to be at a certain temperature, and the only source of the heat is in a highly complicated apparatus, the action of which is solely dependent upon a central ganglion; so that the animal is absolutely individualized, and the destruction of the respiratory ganglion will at once arrest the movements and functions of the whole system. Consciousness itself (which is seated in the brain) is thus abolished; and hence the mistake of Mayo, who, finding destruction of that part of the *medulla oblongata* which contains the respiratory ganglion to produce this effect, supposed this portion of the nervous axis to be the seat of consciousness."[z]

All the preceding elements of the nervous system may, however, be found in the vertebrata. The nervous fibrils are diffused through the tissues until they are imperceptible, as in the planaria; Schwaun observed microscopic ganglia in the mesentery of a frog; and farther researches on the mode of termination of nerves in the tail of the larva of the toad have confirmed these observations.[a] Gall observes that ganglia have been found on the nerves of the arms and thighs.[b] M. Camus has described certain bodies resembling small ganglia as being placed on the nervous fibrils distributed to the plantar and palmar surfaces. And lastly, Dr. Remak of Berlin has lately announced in three separate communications, the discovery of microscopic ganglia in the uterus, kidneys, spleen, liver, heart, lungs, larynx, œsophagus, and tongue.[c] All these may be considered as analogous to the otic and other small ganglia of the face.

[z] LXXIX. p. 229.

[a] XIII. p. 604. I ought to state, however, that Dr. Henlé, assistant to Professor Müller of Berlin, expressed to me his doubts of the accuracy of these observations.

[b] LXXX. i., p. 65. [c] CXXXVII. xxvii., p. 11, 12, 13.

CHAPTER VII.

THE BRAIN AND SENSITIVE NERVES AS THE ORGANS OF CONSCIOUSNESS.

163. The more remarkable of the nervous diseases of women can never be understood without a more extended acquaintance with the laws of consciousness, and the action of the will upon the brain. The general facts embodied in the preceding paragraphs afford a clue of inquiry into this important subject; for just as the diffused nervous system embodies the elements of the ganglionic, and the movements of irritability dependent on the former system, are typical of the excited or reflex,—that is, those dependent on the latter,—so are the ganglionic phenomena illustrative of the cerebral; and the mode of action of the brain itself, as the organ of mind, may in some degree be ascertained by a microscopic analysis of the series of phenomena just reviewed.

The discoveries of modern anatomists and physiologists have not yet been made available for this purpose; and the physiology of the brain has been studied altogether independently of that of the ganglia and of the spinal cord. The labours of Gall, Meckel, Serres, Cuvier, Grant, Tiedemann, and others, have accumulated a mass of facts and analogies of the highest utility, especially in establishing the identity of structure of the brain and spinal cord. For a very comprehensive and lucid epitome of the anatomy and physiology of the brain, I would strongly recommend Mr. Solly's work on that subject to the reader.[c]

164. Leaving the reader to ascertain for himself the truth of the following statements, I shall simply assume that in man the hemispherical ganglia are central to the whole system, and the seat of mind (153); that other portions of the

[c] LXXXI.

encephalon from distinct nervous centres; that each pair of nerves originates from a series of ganglia in the spinal cord, analogous to those of the articulata, but concealed by the addition of fresh parts, and by those nervous tracts in connexion with the central or terminal ganglia; that the ganglia on the posterior roots are not the ganglia of the sense of touch, (which probably form a constituent part of the encephalon,) but are accessary to the secreting structures embedded in the skin, and precisely analogous to the sympathetic, (which subserve the secreting structures of the viscera,) and to the ganglia diffused in the tissues (160); and lastly, that all these ganglia, whether cerebral, spinal, sympathetic, or diffused in the tissues, have the same generic character.

165. That the brain is the organ of consciousness, is a proposition almost universally acknowledged. This is the conclusion of Reid: "In perception the object produces some change in the organ; the organ produces some change upon the nerve; and the nerve produces some change in the brain."[d] This was the received opinion of the ancients, and had no small influence upon their idealogy. Newton, Dr. S. Clarke, Locke, Malebranche, Hooke, Des Cartes, Bonnet, and others among metaphysicians, have more or less admitted it; and it has been asserted by a host of medical observers, as Willis, Haller, Sömmering, Prochaska, Portal, Sabatier, Vicq-d'Azyr, Gall, Cuvier, and C. Bell. It is in the encephalon, then, that those changes which are excited by the will, and by external and internal stimuli, are manifest to intelligence: or, in other words, consciousness consists in a perception of the changes originated in the brain by the forces of matter; and volition in those excited by the will,—a volition being an act of the will.

166. We find that the changes excited in the system by the action of external forces are communicated to the brain by the sensitive nerves; that the will acts upon the muscles so as to excite motion through the motor nerves; and that a third class of nerves, the organic, are subservient to the per-

[d] Essay ii., chap. ii.

fection, preservation, and repair of the vital mechanism, and are influenced by certain mental agencies of which we are conscious,—as the emotions,—but which are independent of the will.

Of these nerves it may be stated, that they all communicate with a hypothetical point of perception and volition, seated in the brain, and termed the *sensorium commune;* this point constituting the central, and the opposite the peripheral, termination of a nerve. It is not intended by this to advance the common doctrine that the nerves depart from one common centre; but rather that they communicate with several circles, situate upon one common circle.

167. The convolutions of the cerebrum and cerebellum have been described by Gall and Spurzheim as consisting of two fibrous layers, containing between them a layer of grey matter;[e] or, in the more recent phraseology of Mr. Solly, they are an extensive surface of cineritious neurine, to which medullary fibres present their extremities. When we consider the enormous surface which these ganglia thus constituted must possess, and the fact, as demonstrated by Weber and Smith, that the sensible points of the retina measure no more than $\frac{1}{8000}$ of an inch in diameter,[f] which may be considered the diameter of the sensible points on the immensely extended surface of the hemispherical ganglia, there is much less ground for the surprise which is expressed on a consideration of the infinite variety of our sensations.

168. It was inferred long ago from the phenomena of health and disease, that the fibrils of nerves must be insulated in their whole course, from the periphery to the centre, and *vice versâ;* but it is only recently that the microscope has enabled physiologists to ascertain the fact from actual observation. Ehrenberg and Müller have added much to our knowledge in this respect; and we are not less indebted to the labourers in the new field of research opened out by Sir C. Bell's discoveries, for a vast number of facts, and some important general principles, exceedingly elucidatory of the phenomena of nervous diseases. It is to the laws of sensa-

[e] LXXX. i., p. 299, seq. [f] XIII. p. 702.

tion which have been thus illustrated that I must, at present, principally confine myself.

169. If the continuity of a sensitive point with the brain be interrupted, external stimuli excite no sensation; and when the sensitive nerve of a limb is divided, the extremity is as insensible to burning, pricking, &c., as if it were altogether separated from the trunk. But if the end of the cut nerve still in connexion with the general system be irritated, sensation is excited as if the terminal point on the limb had been irritated, and not in the part touched. These facts are too well known to need illustration. Independently of the common inference drawn from them, it may be added, that, since one function of the spinal cord, as regards the sensitive and motor nerves, is that of a conductor, all irritation of a sensitive nerve, whether in the brain or spinal cord, or even as far as its termination in the brain, must excite sensation referred to the peripheral point. Sir C. Bell, I believe, was the first to point out distinctly this remarkable fact. He says, "If we select a filament of a nerve of sensation, whether it be pricked or injured, in the foot, thigh, spine, or brain, the perception (sensation?) arising will be referred to that part of the skin where the remote filament is distributed."[g] Dr. Combe has also noticed the fact,[h] and Müller, more recently, has given very copious illustrations of the same general principle, which will repay a careful perusal.[i]

170. The bearing of these general facts upon the phenomena of consciousness is very important. It may be inferred from them that each point of a sensitive nerve has the same properties as the peripheral extremity; and, so far as regards consciousness, the powers of the central and peripheral termination of a sensitive nerve are identically the same.

Sensation is not a perception of the qualities of bodies, but of the changes which these excite in the terminating molecules of the sensitive nerve; and which changes appear to be propagated to the brain (165) from molecule to molecule, just as the (so-called) electric or galvanic fluid; consequently, any sufficient cause acting upon the molecules of a

[g] LXXXII. p. 18. [h] LXXXIII. p. 8, seq. [i] XIII. p. 691, seq.

sensitive nerve in any part of its course, whether in the trunk, spinal cord, or brain, will excite these changes and the attendant sensation, or increase or diminish the susceptibility of change, and so exalt or impair the intensity of the sensation, as much as if applied to the molecule at the peripheral end. Thus, in inflammation, such changes are excited in the peripheral molecules of the sensitive nerves, that we are conscious of heat and pain, and those impressions formerly unfelt or pleasurable are now painful; but, provided similar changes be excited in any molecule continuous with the brain, or in the terminal point on the brain itself, there is a precisely similar state of the peripheral end as occurs in inflammation, although it be not involved in any disease whatever. Tic-douloureux, phrenitis, and hysterical neuralgia, illustrate this inference. So, also, if the ganglia receiving the central termination be rendered, either by disorganization or narcotics, incapable of taking part in the sequence of molecular changes, we have sensation equally abolished as if the peripheral had been so paralyzed.

171. These principles are of the highest importance. They form the connecting link between the phenomena of consciousness, and the molecular changes in organic matter upon which the phenomena of heat, electricity, galvanism, and magnetism depend. They point out a new path of experimental inquiry into the phenomena of life and thought, and, if traced out in all their relations, cannot fail to change the whole aspect of mental philosophy.

It is necessary to observe that each sensitive nerve has special endowments. Changes in the sensitive nerves of the skin cannot be excited by light, or in the gustatory by heat, or in the optic by sounds. Mechanical irritation of the optic nerves excites flashes of light or the prismatic colours, —of the gustatory nerve, acid or alkaline tastes,—of the sensitive nerves of the skin, sensations of burning, pricking, tearing, &c. It is at present an ultimate law of our nature that the molecular changes excited in these different nerves should, when propagated to the brain, be there perceived and distinguished.

CHAPTER VIII.

THE MOVEMENTS OF ANIMALS IN RELATION TO CONSCIOUSNESS.

172. Having stated these general principles respecting the relations of the sensitive nerves to perception, it will be well to inquire into those of the motor system. The result of the inquiry will be, that *mutatis mutandis*, the mode of action of all nervous structures is alike.

For the due performance of the movements of volition, it is necessary that the nervous connexion between the muscles in action and some portion of the hemispherical ganglia be uninterrupted. When broken, any cause applied to the end of the cut nerve still in connexion with the muscles, "which excites a sudden change in the relation of its molecules to each other, whether it be an electrical, chemical, or mechanical stimulus, excites a muscular contraction at the peripheral end."[k] From numerous experiments made by Professor Müller (op. cit.) and others, it is quite certain that there is no actual power propagated from the brain at each volition, but rather that a change in the relations of the molecules is commenced in the brain and propagated to the peripheral end; that certain bio-chemical changes in the blood and muscles are excited, and muscular contraction follows these. So that there is no more a stream of nervous fluid (or of any other) in the motor, than in the sensitive nerves: in each there is a series of changes during action propagated from molecule to molecule, begun in the peripheral end of the one by the qualities of matter, in the central end of the other by the action of the will. (153.)

173. From the preceding statements it is obvious, that any sufficient cause acting upon the ganglia in connexion with the

[k] XIII. p. 639.

motor nerves, whether in the brain or spinal cord, or upon the trunks of the nerves themselves, so that changes in the relations of the molecules shall be originated, will excite movements which will be involuntary. Upon such, the doctrines respecting the excito-motory functions of the cord are partly based. But there is another class of movements, termed reflex, which, although not discovered, have been investigated with much zeal and perseverance by Dr. Hall, and, in connexion with those just mentioned, have led him to some very important and novel views respecting the anatomy of the nervous system.

174. Aristotle observed the tenacious vitality of insects, especially of the myriapods.[k] If a *scolopendra electrica* be divided, the two halves will live, and appear vigorous for a fortnight afterwards, especially the tail part, which contains the greater number of respiratory spiracles. (161.) Numerous analogous facts have been accumulated by a careful observation of the phenomena of life, as well in vegetables as in animals; and the movements have been variously termed, according to the circumstances under which they were developed, those of irritability, or automatic, instinctive, and involuntary motions. They seem to be the results of vital mechanism excited into action independently of the will, and are unquestionably in the greater number of instances altogether independent of consciousness, or conscious sensation. As they are in many cases definite and combined, and closely resemble those following conscious sensation, I shall consider them dependent upon an efficient cause which may be denominated physical sensation, and upon which depend the movements of all vital matter; so that the sensitive plant has physical sensation, as much as the divided scolopendra, the decapitated turtle, or the apoplectic man.

175. Since a large class of vital movements of a definite character are performed without consciousness, we can scarcely resist the inference that there is a class of nerves, with their corresponding centres, to which the laws of consciousness are not applicable; and which must be the organs of physical sensation and involuntary motion. Such in effect is the conclusion at which Dr. Hall has arrived, naming them the excito-

[k] Histor. Animal. lib. iv., cap. vii., De Respir. cap. iii.

motory system, and dividing them into two sets, the incident and reflex nerves. These nerves have been all but demonstrated by Mr. Grainger to exist in the spinal cord;[l] and Dr. Carpenter, more recently, has fully shown their existence in the *invertebrata*.[m] If to these, and the other classes of nerves previously known to exist, be added the antagonizing set described by Bellingeri as governing the motions of flexion and adduction, extension and abduction,[n] we shall have no fewer than eight distinct sets of nerves; namely, first, of common sensation; second, voluntary motion; third, special sensation; fourth, incident sensation; fifth, reflex motion; sixth and seventh, of the antagonizing system; and eighth, of secretion. No good result would follow a discussion of the principles upon which this classification of the nerves is founded; I shall therefore without remark adopt the following, as being practically more convenient.

176. The motor nerves are voluntary and involuntary: the sensitive nerves may be divided into nerves of special and common sensation; and subdivided into cerebral nerves of special conscious sense and common sensation, and ganglionic nerves of special physical sense, of incident sensation, and of common sensation; the latter comprising the nerves subservient to secretion.

The nerves of special conscious sense are distributed to the organs of the senses, including the tactile apparatus on the skin; and perhaps ought to be considered as essentially nerves of physical sense,—nerves of incident sensation, prolonged to the ganglia of consciousness. They are all in communication with the hemispherical ganglia, and communicate to the sensorium the changes produced in the peripheral molecule of the nerve by the qualities of matter.

The nerves of special physical sense communicate physical sensation (174) to the encephalon and ganglia in connexion with the instinctive and involuntary movements; and, like the nerves of special conscious sense, they are distributed on special apparatus. It is thus that reflex movements are excited more vigorously by touching certain points of the surface than others,—as the feet, sphincters, &c.; a fact noticed by Whytt,

LXXXIV. [m] LXXXV. [n] VII. xlii., p. 400.

Volkmann, and others.[o] Mr. Grainger has also reported experiments pointedly illustrative of the fact.[p]

177. That the sensitive nerves of the sphincters are incident, is generally allowed; and that they are also special cerebral, is proved by such facts as the following.—Irritation of the nerves of the bladder being communicated to the spinal cord, in addition to involuntary muscular action, such changes are excited in the sensory fibrils traversing the cord and coming from the skin covering the perinæum, groins, thighs, and orifice of the urethra, that sensations are felt as if in these parts, (170,) but not in the bladder or urethra; irritation of the intestinal canal, as from worms, may excite reflex movements, (tetanus,) or the sensation of tickling or itching of the nose, and irritation of the pharynx, and consequent vomiting, —the sensation being felt at the points of junction of the mucous and dermoid membranes. And so, when there is actual disease of the spinal cord, the special sensation of tingling is felt in the skin, but not in the stomach or intestines.

The same general principles apply to the action of the nerves subservient to secretion; there may be secretion with or without sensation, according to the action of the exciting cause upon nerves of common sensation, or of special cerebral or ganglionic sense.

178. When laughter follows tickling the feet and the sides of the thorax, there is conscious sensation; but the laughter is probably dependent on physical sensation. If there be disease of the spinal cord, so that the continuity of the nerves of the lower extremities with the hemispheric and respiratory ganglia be broken, we have neither laughter nor conscious sensation when the feet are tickled: should the dorsal and lumbar ganglia be uninjured, and in an affectable state, there is convulsive retraction of the extremity: and if the series of changes in the nerves causing the last-mentioned phenomena could be propagated to the respiratory ganglia, and there arrested, we might have loud laughter without consciousness. Indeed, many instinctive and involuntary movements are only accompanied by the simple sensations of pleasure and pain, especially those intended for the conservation of the individual.

[o] XIII. p. 722, and note by Baly, p. 710. [p] LXXXIV. p. 55.

CHAPTER IX.

THE INSTINCTIVE ACTIONS IN RELATION TO CONSCIOUSNESS: THE BRAIN SUBJECT TO THE LAWS OF REFLEX ACTION.

179. GALEN's experiment on a fœtal kid was perhaps the first which demonstrated that instinctive actions were at least independent of experience; but the bias to metaphysical theory for a long time prevented them being viewed in their proper light. In 1771, Unzer pretended (to use the words of Gall) that the irritation of a nerve, whether it arrived at the soul or not, could of itself, and independently of the will or power of the soul, produce an impression upon the nervous and muscular systems, and excite movements. He thus attempted to explain the actions and habits which appear spontaneous in certain animals. He showed, also, that in those classes of animals which were supposed to possess a soul, and in man himself, movements take place without the participation of the soul, and which consequently continue after death.[q] Prochaska treated at length of those movements subservient to the conservation of the animal, showing how they might be excited by external stimuli, without the intervention of the will or of consciousness;[r] and Mr. Grainger, unacquainted apparently with these writers, takes up precisely the same doctrine.

180. Dumas erroneously inferred, from various facts, that voluntary movements and consciousness do not depend upon the brain, mistaking altogether the character of the phenomena he quoted in support of his opinion. Thus Perrault cut off

[q] LXXX. i., p. 7.

[r] Ibid., p. 81.

the head of a viper or lizard, and removed the intestines, yet the animal lived, and even ran to its hole. Duvernay removed the brain from a pigeon without apparent injury, the bird continuing to live, eat, and perform various functions after the mutilation.

Gall was certain that the opinion of Dumas was erroneous; but he never supposed that there might be all the phenomena of conscious sensation without consciousness, and independently of the hemispherical ganglia. He therefore treated the facts as unworthy of credit; called them edifying tales; and recommended physiologists to verify observations before they founded theories upon them which contradicted all the known laws of organization.[s]

181. Yet Gall acknowledged that analogous phenomena, namely the instinctive actions of young animals, take place without consciousness, and even attempts to explain them.[t] But he seemed anxious rather to refute the accusations of those who maintained that he was renewing the old doctrine of innate ideas, than to search thoroughly into the matter. The doctrine of innate ideas, as it respects the instinctive acts, is founded in nature. Why does a chicken, or a young partridge, with the shell still on its tail, peck at a spider or a grain of corn? Or why does the calf of a tame cow, by a wild bull, exhibit as soon as born an unusual ferocity? No one will assert it learns it from its dam. But Gall extended the doctrine of innate ideas beyond the instinctive acts, and fell into the views of Unzer and Prochaska. He applied it to the passions, and maintained that joy, sorrow, fear, &c., are not excited by the will, but felt before the individual has so much as dreamed of them. All that passes is an arrangement produced by nature, intended for the external world, to secure "la conservation de l'animal et de l'homme, sans qu'il y ait conscience, reflexion, ni participation active de l'individu."[u] He also asserted that these passions, when of a certain intensity, are accompanied by actions which are independent of the will and consciousness, but which all tend toward the end proposed by nature, namely, the conservation and ease of the indi-

[s] LXXX. i., p. 81. [t] Ibid. ii., p. 11. [u] Ibid. ii., p. 12.

vidual: thus, in fact, classing the phenomena of the passions with the instinctive movements and those excited by external stimuli independently of consciousness and of the brain, and which have been remarked on by Unzer, Haller, Prochaska, Alison, Hall, Müller, and Grainger.

182. The importance of these doctrines is apparent. They corroborate the truth of the proposition already laid down, that the cranial ganglia, although the organ of consciousness, are subject to the same laws as those which govern the other ganglia, the diffused nervous system of animals and the vital mechanism of vegetables. In short, that the passions and the movements are dependent on them, as laughing, sighing, sobbing; the instinctive feelings and their conjoined movements; and the whole series of combined spasmodic and convulsive movements, from those of epilepsy and chorea down to the retraction of the foot by a decapitated frog, are seated in the same grand division of the nervous system, and dependent on the same general laws.

183. It is not alone from the facts of natural history that this inference respecting the seat of the instincts and passions is derived. Pathology supplies us with illustrative proofs. A young married female, labouring under a nervous affection, had palsy of the facial muscles. She was unable to retain her saliva, had no command over the muscles of the face, and had completely lost the power to produce articulate sounds. But the eyelids, although not under the influence of the will, closed involuntarily on the sudden approach of a body to the eye, performing an instinctive act of conservation. The patient also smiled and laughed, and the muscular motions thus produced were the same as those observed when there is no paralysis. The sound of her laughter proved also, that the muscles of the larynx, although cut off from the control of the will, were capable of being excited into action by a risible idea.[v] This is by no means a solitary case: Alison, Abercromby, and Bell have noticed instances of the same kind. That part of the nervous system acted on by the passions may be alone partially paralyzed. Dr. Erdmann, of

[v] XXXVII. iv., p. 500.

Dresden, relates a case in his medical observations of a boy whose face, when he was put into a passion, became quite pale on one side and red on the other; there was an exact boundary on the centre of the face. If heated by exercise, the whole face was equally red.[w]

An Essay on the origin and transmission of instincts, based upon facts, and written honestly and fearlessly, would be most curious and instructive. I am aware that there are many who will consider it dangerous to concede, that apparently pure mental acts are only the results of vital machinery excited into action by physical agencies; but these should remember that this vital machinery in man is also adapted to the phenomena of a *moral* world, in which the will, and not instinct, is the prominent feature. It is not probable that inferior animals have a moral consciousness; that is of the power to will or not will, and of a Diety. But "Quæ est enim gens aut quod genus hominum, quod non habeat sine doctrina, anticipationem quondam deorum? quam appellat *πρόληψιν* Epicurus," &c.[x]

[w] L. ix., p. 288.

[x] Cicero de Naturâ Deor., lib. i. § 16, 17.

CHAPTER X.

THE ACTION OF THE WILL, AND OF INTERNAL AND EXTERNAL STIMULI, ON THE HEMISPHERICAL GANGLIA.

184. From the preceding statements it is obvious that changes in the sensorial fibres of the encephalon may originate internally as well as externally, and excite movements. Tickling the fancy will excite laughter, as much as tickling the feet. In fact, it may be hypothetically supposed that there is a surface on which sensorial fibres terminate, connected with ideas, and which is analogous to the sensitive fibres on the skin, and on mucous membranes. It becomes a matter of some importance to inquire how far the will can act on sensorial fibres in general, and whether external or internal stimuli acting upon them can excite sensations, emotions, and ideas, simple and compound, corresponding to the whole class of excito-motory phenomena.

185. Firstly, can the will excite such changes in the sensorial fibres as shall be perceived? An act of memory is an act of the will, and we re-excite by it those changes which first constituted the perception we recall. It is thus when a painter makes a picture of a friend who is absent or dead. Further, that volition will excite changes in the fibrils of the brain is evident from the phenomena of attention. Attention, like motion, may be voluntary or involuntary:—when it is voluntary, as in voluntary motion, we experience a feeling of fatigue, and the action is also intermittent. D. Stewart says, "that when we are employed in studying an object not interesting, it is not an exclusive and steady attention we give it, but we are losing sight of it, and recurring to it every instant," &c.[x]

[x] LXXI. Ch. vi., § i.

When it is directed to the perception of changes from without, there is such a change excited in the central terminations of the sensitive nerves, that more vivid perceptions result; and if the attention be concentrated in one set of nerves, others are in a state analogous to paralysis. Marini, an Italian poet, while revising his poem "Adonis," experienced this paralysis so remarkably, that he burnt his leg before he was aware. How often when absorbed in thought do loud sounds fall on the ear unnoticed.

186. It is singular that the action of the will on the sensorial fibres has excited so little notice. In paralysis the power to recall past events, and to attend to the present, is almost as much impaired as motor power: on the contrary, the action of the will on the sensorial fibres during acts of memory and attention is followed by remarkable phenomena. Van Swieten relates the following instructive case:—A literary character, intensely studious, became so ill that he was instantly seized with giddiness if he attentively listened to the relation of but a short story. When he attempted to recollect, he felt exquisite distress, and sometimes swooned, which was followed by a sensation of great weariness. Yet he could not desist from the attempt at recollection when once begun, but was obliged to proceed with it even against his utmost efforts until he fainted away.[y] An act of the will will frequently excite such changes in the brain as to arrest an incipient paroxysm of angina pectoris or epilepsy; thus people are said to ward off an attack by an effort.

187. By an act of the will we can also excite new sensations. Let an individual concentrate his attention upon the interior of his head for a few minutes, and he will experience various sensations in the skin analogous to formication. Any one may produce at will a sensation in his finger-ends, by directing his attention to it. Dr. Elliotson mentions instances of this kind,[z] and they and analogous cases are easily explicable by the proposition previously laid down, namely, that the peripheral and central ends of a sensitive nerve are identically the same.

[y] LVIII. iii., Aph. 1075. [z] LXXXVI. p. 497.

The phenomena of mesmerism (so called) are all illustrations of the power of the will over the brain. In these cases we have another point of analogy between this sensorial will and voluntary motion, namely, that an act of the sensorial will becomes easier by repetition, and at last involuntary. After an individual has been mesmerized repeatedly, certain movements (passes) are no longer necessary to the excitement of the sensorial volition; it has become a habit, and is produced by any insignificant associated circumstance. These phenomena may at last be thus produced at pleasure, as by an internal effort, by arresting the respiration and so arresting the circulation through the brain, &c. It is thus disinterested observers have been imposed upon; and thus hysterical girls can bring on convulsions, and any person ideas, sensations, and mental emotions, with more or less facility. Savage and superstitious nations have been ever the dupes of men and women who have discovered this power of the will over the sensorial fibres, and the brain generally. The Rev. W. Ellis remarks of the Pythian Priest of the Polynesian Islands, "As soon as the god was supposed to have entered the Priest, the latter became violently agitated, and worked himself up to the highest pitch of apparent phrenzy; the muscles of the limbs seemed convulsed, the body swelled, the countenance became terrific, and the eyes wild and strained. In this state he often rolled on the earth, foaming at the mouth, and in shrill cries revealed the will of the god."[a] Of this character are the whirling dervises, &c. There can be no doubt that this power of exciting real phenomena by an act of the will on the central ganglia of motion and sensation has frequently aided impostures of every kind.

188. But an act of the attention may be, and often is, involuntary or instinctive, when it is to be classed with the conservative acts (179); or rather with the excito-motory phenomena. Point at a nervous female, and she will complain of a sensation as if cold or warm air were blowing on the part pointed at. The sensation probably depends upon

[a] LXXXVII. ii., p. 235.

changes in the central terminations of the sensitive nerves, excited by the act of attention. Of a similar character are many sympathetic phenomena: *e. g.*,—A female, aged forty-eight, who had not menstruated for eight years, while attending her daughter during a tedious labour, experienced uterine pains, a sanguineous discharge from the vagina, and on the third day the mammæ swelled, and became painful to the touch; a milky fluid then escaped from the nipples, and all the symptoms disappeared. Dr. Paillard relates a similar case.[b] Sir B. Brodie has had patients, who, having friends with tumour of the breast, have worked themselves up into the belief that they had the same disease. Indeed, it is not improbable that the disease itself may be thus produced. The same author also remarks, that there is no part of the body but what seems to be in pain during a state of disease, if the patient's attention be drawn to it.[c] The effect of fearful attention on the nervous system has occasionally proved fatal. In the third volume of The Doctor a remarkable instance of this kind is related. The portrait, No. 113, in the British Museum, is of Thomas Britton, surnamed "The musical small-coal-man." A ventriloquist, one of the company at a dinner party at which he was present, predicted his death that night; and such was the impression made, that it actually took place. The effects of mesmerism, of the "evil eye," of sorceries and incantations, are of this class. Thus, "the Polynesians," as Mr. Ellis states, "were confident their sorcerers had the power of inflicting bodily disease from actual facts; but the sorcerers invariably confessed that incantations were harmless when practised on Europeans,"[d] just as mesmerism is a failure on strong-minded men and women.

189. The substance of the preceding remarks was first written in the summer of 1838, and formed part of an essay, which appeared subsequently in the Edinburgh Medical and Surgical Journal, and was in the hands of the Editor in October of the same year. Dr. Holland, in the fifth chapter of his Medical Notes and Reflections, headed "Effects of Mental Attention on bodily Organs," I found with great satis-

[b] XIV. i., p. 550. [c] XXX. i., 1838-9, p. 40.
[d] LXXXVII. ii., p. 232.

faction, to take a similar view of the subject in many respects, although led to it by a different process of inquiry. Dr. Holland refers particularly to the injurious effect which is produced by hypochondriacs upon their viscera, by a special direction of the attention to them; but if he will refer to Professor Dubois's recent work on hypochondriasis,[e] he will find this general principle applied to the explanation of the pathology of the disease. Dubois divides the phenomena into three stages: in the first the mind only is affected; the patient is harassed by imaginary diseases, and he concentrates his attention upon one or other of the viscera; hereby changes in their innervation are excited, when the second stage is developed; and in the third, these merely nervous affections terminate in organic disease of the affected organs. Dr. Holland will perhaps learn with pleasure that Bonnet advocated metaphysical doctrines quite corroborative of his own opinions; since in his "Essai Analytique sur les Facultés de l'Ame," chap. xi. and following, he maintains the views respecting the agency of attention on the fibres of the brain which I have already advocated. (185.) Bonnet's definition of attention is admirable:—"L'attention est un certain exercice de la force motrice de l'ame sur les fibres de son cerveau."[f] It will be observed that I have followed a line of investigation different from those of either M. Bonnet, Professor Dubois, or Dr. Holland; beginning, in fact, with the endowments of the sensitive nerves as part of a more general system, and applying these to the hemispherical ganglia. The effect of the phenomena of mesmerism will be useful in this, that the attention of philosophers will be now more than ever directed to the action of the will on the sensorial fibres of the brain and through these on the sensitive nerves, to the laws by which it is governed, and to the changes in distant organs which follow its agency.

190. The analogy between the voluntary and involuntary systems of motor and sensitive nerves is partly demonstrated by the previous facts; it remains to inquire whether there be anything in the changes produced in the sensorial system by

[e] CXXII. pp. 167, 171, 230, et passim.

[f] Op. cit., ch. xi. § 136.

external and internal stimuli analogous to those excited in the motor. Of these changes it is certain we can only judge by the phenomena produced in each case, sensations being analogous to movements, abolition of consciousness to motor paralysis.

Internal stimuli may consist in organic disease of the nervous fibrils; in increased or retarded circulation of blood through them; in alteration of its constituents by poisons; or in changes induced in it, or in the nervous fibrils, by the passions. We may have total paralysis, as in profound sleep and coma; partial paralysis, as in dreaming, somnambulism, delirium, insanity. There may be undue excitement of one part with or without paralysis. There is no paralysis in cases of spectral illusions, if the patient be sane, the spectra being analogous to spasmodic movements; but when there is paralysis of the comparing and judging organs the individual cannot correct the wrong impressions produced by spectral illusions, either by the evidence of his senses or by his reason: he is insane. And such is the case in dreaming and delirium; in the former the senses being also in a state analogous to paralysis. For illustrations of these and other sensorial phenomena, I must refer the reader to my essay before mentioned, in the fifty-second volume of the Edinburgh Medical and Surgical Journal. The following general law must never be forgotten; namely, that when the functions of the motor and sensitive system are gradually impaired, there is exalted affectability and energy observed before the paralysis. This law applies to all cases of disordered innervation in which the cause does not act instantaneously, as in poisoning by alcohol, opium, strychnia; in mania, in approaching death.

CHAPTER XI.

THE PATHOLOGICAL AND PHYSIOLOGICAL RELATIONS OF THE NERVOUS SYSTEM TO THE OVARIA.

SECTION I.

THE PATHOLOGICAL RELATIONS OF THE DORSO-LUMBAR PORTION OF THE SPINAL CORD.

191. It is obvious from the statements in sect. v., chap. ii., that the ovaria have a direct influence upon the developements of the structures in connexion with the dorso-lumbar of the cord: it remains to be ascertained how and upon what principles they may exert a morbid influence upon the same portion of the central nervous system.

The Messrs. Griffin quote the following remark, made by Abernethy in his chapter on nervous and muscular disorders: —"It is in my opinion sufficiently evident, that disorders of the digestive organs sometimes affect the different portions of the medulla spinalis, and produce sympathetic disorders of the body and limbs, without operating through the medium of the brain, as was formerly supposed."[g] This observation respecting the pathological connexion of the spinal cord with disease of the abdominal and thoracic viscera is not new, but has been made by Hoffmann, Boerhaave, and others; and is the foundation of the ganglionic as well as spinal pathology of hysterical, hypochondriacal, and nervous complaints in general.

192. Mr. Stanley observed paraplegia to occur in several cases without any appreciable disease of the spinal cord, or its membranes: the kidneys, however, were found inflamed

[g] LXXXVIII. Preface, p. vi.

and suppurated; and consequently Mr. Stanley justly concludes, that the true source of the paraplegia was in the kidneys, the spinal cord being affected secondarily.[h] How frequently intestinal or visceral irritation will cause paralysis or convulsions, is well known. (173.) Indeed, it is universally acknowledged that irritation of the nerves of one organ may be communicated to those of a second having an anatomical or functional connexion. The catamenia are seldom established without aching and neuralgic pains of the back and lower extremities, partial anæsthæsia, (numbness,) and tetanic contractions (cramps) of the legs. The action of the testicles on the muscles of the back in certain states is well known, causing an aching which is merely a sense of fatigue arising from impaired power of the lumbar muscles. The transit of a calculus along the ureter will cause pain, retraction of the testicle, (spasm of the cremaster muscle,) and a variety of sensations in the thighs. In the diseased bladder of old men, there is very constantly painful heat and tenderness of the soles of the feet. Stricture of the urethra is frequently accompanied by numbness inside the knees, and pain in the loins, hips, down the thighs, and in the soles of the feet.[i] The introduction of a bougie will frequently cause pains in the thigh, and will also relieve pain in the foot (Brodie); but the most curious illustrations of this incident action of the sensitive nerves upon the spinal cord, is the counter irritation which the New Zealanders successfully practise in traumatic tetanus, by making the urethra the track of a coarse seton thread. The cramps of diarrhœa, and many other symptoms of diseases implicating the abdominal viscera, might be mentioned, if not obvious to every one. Dr. Billing has applied this principle to the practice of medicine for some years.[k]

193. This reciprocal action of the spinal cord and nerves of the viscera has been generally acknowledged in some instances, but scarcely suspected in others. Irritation of the dental nerves in dentition is rightly considered the cause of many nervous diseases of children; but rarely is the mutual

[h] XLV. xviii., p. 278. [i] XXXIII. p. 31. [k] CXXI. p. 108, seq.

action of the cord and sentient nerves of the abdominal viscera thought of, although it is one great reason why the pathology and treatment of their diseases is so obscure and difficult; it will therefore be useful to recur to the general physiological principles by which this mutual action is regulated. Professor Müller has discussed the action of one set of sensitive nerves upon another, under the heading "Of the Radiation of Sensations." He remarks, it occasionally happens that one sensation excites another, or that sensations in disease extend to parts not actually affected; and instances sneezing, from a strong light, and other facts analogous to those I have mentioned in the preceding paragraph. Of the two explanations of this general fact which he attempts, the second is in accordance with the general doctrines advocated in the previous section, and is worth quoting at length. "According to the second explanation of these phenomena, the sympathetic sensations are the result of the radiation of the irritation from the fibres primarily affected upon the roots of other fibres in the brain or spinal cord; just as in the production of reflected motions the impression conveyed by the sensitive nerves to the spinal marrow is communicated to motor nerves; the only difference being, that when the sympathetic sensations are produced, the radiation of the impression does not reach the motor nerves, but only the sensitive fibres arising from the surrounding part of the cord, or at any rate affects these at the same time as the motor nerves. It must be remarked, however, that if we explain the sympathetic sensations by such reflex action, we must pre-suppose that currents or oscillations can be propagated in the sensitive nerves in both directions,—from the brain as well as towards [to] it. It is not known whether this be possible, or whether the sensitive nerves can propagate their actions in the centripetal direction only. It is interesting therefore to know that we can explain the phenomena, even though the sensitive nerves do not act in the centrifugal direction. We have seen (p. 690) that the same sensation seems to be produced at whatever point of its length a nervous fibril may be irritated, whether at its peripheral extremity, at its middle, or at its origin in the brain or spinal cord; and that this sensation is

felt in the parts to which the nerve is ultimately distributed; the mere 'radiation' of an impression, therefore, from a sensitive nerve in the substance of the brain or cord, so as to affect the origins of other sensitive fibres, will be sufficient to produce sympathetic sensations."[l] Upon the whole, this is an explicit and rational explanation, but would have been better if expressed in simpler terms. The impression on a sensitive nerve need not "radiate;" changes in other sensitive nerves will be excited if the impression do no more than alter the state of the circulation of the blood in them; this will be followed by increased affectability and molecular changes, themselves giving rise to new, or sympathetic sensations. (169.) Almost precisely analogous views were promulgated by Dr. Copland so far back as the year 1824.[m] Still earlier, Cabanis laid down the principles of the reflex action of the sensitive nerves, confining them, however, to the abdominal ganglia. "Il existe dans le corps vivant, indépendamment du cerveau et de la moelle épinière, differens foyers de sensibilité, où les impressions se rassemblent en quelque sorte comme les rayons lumineux, soit pour être réfléchies immédiatement vers les fibres motrices, soit pour être envoyées au centre universel commun."[n]

194. The doubts respecting the centrifugal action of the sensitive nerves, expressed in the preceding quotation by Professor Müller, are repeated in other parts of his work.[o] He mentions, however, the affection of the lachrymal nerve under the influence of certain passions and ideas, as being apparently an instance of this action, if it were certain that the lachrymal nerve is not, like other branches of the fifth nerve, accompanied by branches of the sympathetic. This question might be considered in a more comprehensive manner. In the influence of anger, (183,) shame, and other passions, we have an agency acting on the capillaries of the face, proceeding in man, unquestionably, from the encephalon, and producing effects precisely analogous to those following the use of external stimuli,—as rubefacients for example. Grief, terror, and simple emotions, and even the

[l] XIII. pp. 699, 700.
[m] LXXXIX.
[n] LIII. Chap. viii. § ii.
[o] Pp. 726, 727.

act of involuntary attention, (188,) will excite or repress the secretions of the mammæ, the salivary glands, the intestines, kidneys, and skin, and alter their structure; (see paragraphs 188, 189;) as well as paralyze or convulse the motor fibres; and if there be no secreting structures, without the grey or organic nervous fibres, as Professor Müller seems to think, then the inference must be, that the passions act on these organic fibrils, rather than that they do not act on the secreting nerves at all.

195. Upon the whole, however, there is every reason to conclude that there is an incident action upon the sensitive nerves in their course through, or termination in, the different cranial and spinal ganglia, derived from the sensitive nerves of the whole of the mucous membrane, whether it be that of the viscera, or glandular structures of the skin; and not merely causing sensations, but also increasing and diminishing the secretions of the viscera, and altering their structure: also, that the passions, the will, and other stimuli, acting upon the sensitive fibres of the brain, can produce analogous effects.

This general principle is applicable to a great number of phenomena. We can learn from it how the passions excite so great a number of nervous diseases in women. We can explain by its means many local neuralgiæ. Structural, or functional disease of a viscus will thus produce such a change in the sensitive fibrils situate in, or arising from, the corresponding portion of the spinal column, that their susceptibility of painful impressions is increased. Any nerve passing round a tendon, or through a bony canal, in which it is subject to irritation or injury, will, when thus rendered affectable, readily become the seat of neuralgia. It is thus disease of the liver is accompanied by pain under the right shoulder, corresponding in situation to the distribution of the supra-scapular nerve which has to pass through an osseous or tendinous foramen of the same name. It is thus the intercostal nerves are subject to a neuralgia exactly resembling that of the face, termed tic-douloureux; it is thus there is tenderness and neuralgia of the back, sternum, and left arm, in cases of chronic disease of the heart. Hence also the various sensations of creeping, pricking, burning, &c., felt

by nervous people. This principle enables us to explain many curious and otherwise inexplicable forms of disease. Thus the singular march of erratic erysipelas is easily understood, on the supposition that the disease is caused by a morbid state of the nervous centres from which the nerves of the part affected take their origin; and forms a beautiful illustration of the general law. If the reader will glance over Dr. Graves's accurate description of this affection, in which it is shown how it progresses symmetrically, invariably attacking certain parts of the skin, (those supplied from the respiratory tract,) while others are left untouched, and then trace the anatomy of the nerves of both the free and affected parts, in the next case which comes under his notice,—he will have a vivid shadow, or a sort of photogenic drawing, depicted on the skin, of the locality of the disease, and of its progress through the nervous centres, as externally it creeps along from the nose to the cheeks, from these to the ears, from the ears to the shoulders, neck, chest, and upper part of the arms, in fact over the parts covered with hair. (24, 25, 56.) This principle also admits of the most extensive and useful application to therapeutics, and brings the endermic method of treatment under positive general laws. Thus, in paralysis of the bladder, we wish to excite the affectability of the nerves of the bladder; a blister applied to the loins for half an hour, or an hour, will frequently produce the desired effect. It is by this principle that we can understand the absurdity and positive injuriousness of such plans of treatment as dividing the nervous trunk in many cases of tic-douloureux. Not only may the cause of the disease be seated in the medulla oblongata; but we are prevented using local narcotics successfully, as their action on the nervous fibrils on the skin cannot be carried to the spinal cord, and radiated upon the roots of the affected nerves. In the inquiry into the relations which gout bears to hysteria, (Part II., ch. v., s. 2,) the reader will find a useful application of this principle to the explanation of the mode by which the ovaria and testes, in acting injuriously on the secreting powers of the kidneys, through the spinal cord, indirectly give rise to many anomalous forms of disease. And, lastly, it is by this principle that we can explain and counteract the morbid influence of the

ovaries upon the dorso-lumbar portion of the cord, in the hysteric disorders of the pelvic viscera.

SECTION II.

THE RELATIONS OF THE RESPIRATORY GANGLIA TO THE OVARIA.

196. The action of the ovaries, from their contiguity, on the dorso-lumbar portion of the cord, is easily explicable on the foregoing principles; but not so the indisputable influence of the ovaria and testes upon many portions of the vital mechanism in close relation with the respiratory ganglia, as demonstrated in the earlier sections of the work. It is of importance, however, to our subject, to inquire by what means the ovaries exercise this influence; that is to say, first, whether it be communicated directly to the organ implicated, through special communicating nerves; or, secondly, whether a similar communication exist between the ovaries and the nervous centres, in connexion with the ovarian dependencies; or, thirdly, whether there be special ganglia in connexion with the organs of generation, and seated in the encephalon or medulla oblongata; or, fourthly, whether the ovaries pour a secretion into the blood which has a special action on these structures.

197. With regard to the first proposition, I think no fact can be adduced in support of it. The last has a general fact in its favour, namely, that substances taken into the circulation will act upon one part of the nervous centres in preference to another. Of the second, it may be remarked that emotions or passions act upon precisely the same structures as those upon which the ovaries act, and excite analogous phenomena, and we are certain that the action of these is from the centre to the circumference; so that sensorial changes may be propagated from the generative structures to their appropriate nervous centres, and there give rise to a series of changes, to be reflected, on the one hand, to the sensorium of consciousness, on the other, to the organs on the

external periphery, and so give rise to intellectual phenomena, and a series of movements and secretions.

With regard to the third, the disciples of Gall conceive that that talented individual has set the question at rest; he, as is well known, having appropriated the cerebellum to the sexual passion, and made developement of the generative organs, and of their accessory structures, dependent upon this portion of the encephalon. Gall has immortalized himself by his persevering maintenance of the indubitable truths, that the brain is the organ of mind, and that it is a compound organ; but he was not free from the very common and pardonable fault of all advocates of general principles,—that of pushing the application of them further than warranted by fact.

198. The appropriation of the cerebellum solely to the sexual impulse is as contrary to the first principles of phrenology as the assertion that the brain is the individual organ of mind. The cerebellum is generically analogous to the cerebrum; and *a priori*, it appears unreasonable to appropriate so extensive a surface to acts which, in many animals, occupy so disproportionate a portion of their existence. All the arguments in favour of the doctrine based upon the relative magnitude of the cerebellum are inconclusive, because, in all animals, it is as proportionate to the activity of the vital movements of the system in general, as of the generative organs in particular. Compare, for instance, the different magnitudes of the cerebella of birds and reptiles with the difference in the number and complexities of the movements of conservation and reproduction exhibited by the two classes. In the one the rearing of the young calls into action architectural skill, unwearied assiduity, courage, cunning, and other powers; in the other, a hole is scratched in the sand, and there the egg is dropped and abandoned. Men, too, with large cerebella, are as remarkable for the larger developement of their muscular system as for their sexual propensities. In short, the natural history of the developement of the cerebellum, its anatomy and anatomical connexions, and numerous physiological and pathological facts, furnish abundant proof that Gall's doctrine is erroneous. I should not omit to state, however, that the facts mentioned by Gall and his followers, more particularly some very recent

cases of injury of the cerebellum,[p] considered in connexion with the corroborative experiments of Dr. Julius Budge, cannot but lead to the inference that there is some connexion between the cerebellum, or medulla oblongata, and the ovaria and testes.

199. Dr. Budge found that irritation of one side of the surface of the cerebellum caused the testicle of the opposite side to be raised up: a deep irritation did not produce this result; from which Dr. Budge infers, that the nervous fibrils running to the testicles are superficial,—an inference of considerable importance, if correct, as it would serve to explain some of the effects of meningeal inflammation. It may be also here stated, that in subsequent experiments Dr. Budge found irritation of the tubercula quadrigemina and corpora striata to excite vivid peristaltic movements of the intestines.[q]

The Anatomical Relations of the Respiratory Ganglia.

200. The question just mooted cannot be satisfactorily solved in the present state of our knowledge. We have demonstrated, however, that the sexual organs act specially upon the organs in general connexion with the respiratory ganglia; consequently a brief notice in this place of some of the relations of the latter may be advantageous.

In addition to the well-known anatomical relations and distribution of the respiratory nerves, it may be remarked that this system is in very close connexion with the whole external periphery. Professor Müller observes, that "the whole system of respiratory nerves can be excited to action by irritation of any part of the mucous membranes from the mouth to the anus, from the nostrils to the lungs;"[r] and Dr. Hall, in his theory, makes the spinal nerves distributed on the skin to be the excito-motory nerves of respiration.[s] This is nothing more than might be inferred from the function, natural history, and comparative anatomy of the respiratory system. It is the most essential to the being of the animal (157); and the vagus in many animals takes the place of the sympathetic nerve. This is the case in snakes, for instance, in which it is distributed to the alimentary canal. In the myxinoid fishes

[p] XXXVII. viii., p. 576.
[q] XIV. i., 1839-40, pp. 829, 959.
[r] XIII. p. 715.
[s] XC. passim.

the vagus extends as far as the anus, and the sympathetic nerve is absent.

201. Now if the statements of Hall and Müller be correct, there must be a central tract of nervous matter composed of those nervous fibrils which connect the respiratory ganglia with the skin and alimentary canal. And this is precisely the bundle of fibres described by Sir C. Bell as the respiratory tract, and which are in connexion with the olivary bodies, now shown beyond question to be the respiratory ganglia.[t] And, when we consider the distribution of the nerves with which they are connected, we must conclude that these bodies are also the ganglia of the nutritive apparatus. These statements are of great importance to the elucidation of our subject; for the instinctive movements and the passions (181) are so intimately connected with respiration and nutrition, that the anatomical relations of the ganglia to the seat of the passions cannot be overlooked in an inquiry into the nature of diseases which are ever caused and influenced by them.

202. According to Gall, a considerable band (*un fort faisceau*) of fibres proceeds from the olivary bodies behind the grey matter of the pons varolii, and between its transverse fibres, into the crura cerebri, of which they form the posterior and inner part. After being increased in the locus niger, they ascend and form the posterior cerebral ganglia.[u] Previously to entering these, some fibres have been observed to turn inwards, so as to give the tubercula quadrigemina their medullary investment, and to enter the valve of Vieussens. So that the respiratory ganglia (or olivary bodies) are in direct connexion with the optic, posterior cerebral, and hemispherical ganglia.

Sir C. Bell does not appear to consider the bands, described above as springing from the olivary bodies, to be connected with them: he names them cerebral strands of sensation, being separated from the motor strand in the crus cerebri by the locus niger. Neither does Mr. Solly adopt Gall's views: he describes the fibres as ascending principally to the outer side of the corpus olivare, and plunging into the pons varolii to pursue their course as stated by Gall.

[t] LXXXI. p. 146, seq. [u] LXXX. i., p. 278.

The anatomical views of Bellingeri, though at variance with the preceding, throw considerable light upon the question. He considers the lateral portion of the antero-lateral column (Bell's respiratory tract) to be a distinct band, which he names the lateral strand. From this the accessory nerve arises, and on it the respiratory ganglia are placed. The fibres derived from this lateral strand, according to his theory, regulate the instinctive, involuntary, and organic motions. So far Bellingeri's views are in general accordance with those just advanced. But he considers the restiform bodies to be the respiratory ganglia; an opinion at variance with many vivisections, and with the statements of Gall, Grant, and Tiedemann respecting the comparative developement of the optic lobes and olivary bodies.

PART THE SECOND:

GENERAL PATHOLOGY & THERAPEUTICS.

CHAPTER I.

GENERAL DESCRIPTION OF THE NERVOUS DISEASES OF WOMEN.

203. When we reflect upon the facts and principles developed in the preceding pages;—upon the multiplicity of agencies by which the nervous system may be influenced, and the natural susceptibility of that of woman increased; upon the numerous connexions of the reproductive organs in each individual organism, extending directly or indirectly to every important structure; and upon the equally extensive relations of these organs to the general scheme of vital developement, there is little room left for surprise at the infinite variety of evanescent forms, which, when occurring more particularly in women, the diseases of the nervous system assume. Ever essentially the same, they are continually differing in their distinguishing characters. The alternate gloom and gaiety, and mutable love and hatred of the hysterical woman, are really not less remarkable than the rapid transition from robust health to death-like trance,—from acute bronchitis to peritonitis or hepatitis,—from active effort to helpless paralysis, observed in these diseases. They are all evidences of the same state of the nervous system, variously developed as the causes vary. As I propose in another part of the work to review each important symptom as a special disease, and elucidate its diagnosis, pathology, and treatment, in the

manner most calculated to be practically useful, I shall not enter into minute detail in the present section.

204. The common paroxysm of hysteria has usually constituted the starting point in describing hysteric diseases, as being that to which the term was originally applied. These forms, however, are frequently not observed at all in those cases in which there is marked derangement of the general health; and the paroxysm itself assumes the most varied types, from the half-feigned fit of the petulant nervous woman with impaired health and luxurious habits, to the decided epilepsy, coma, and carus of the stout and robust.

205. The hysteric paroxysm, although usually affecting the system at large, may more particularly involve some one vital organ; thus the renal secretion is very constantly rendered imperfect, and the hepatic so far arrested that jaundice has supervened. Sometimes there is colic, or tympanites, sometimes spasm of the diaphragm, occasionally long prolonged syncope, not unfrequently spasm of the respiratory muscles of the most singular character, and very frequently spasm of the larynx causing croup and aphonia, and of the œsophagus giving rise to the sensation of an oppressive globus by preventing the exit of the flatus secreted into the stomach and intestines during the fit. Should the brain be the organ implicated more than others, the various phenomena connected with impaired consciousness will be manifest, as spectral illusions, delirium, somnambulism, and temporary insanity. Or in the words of Baglivi: "Si caput occupaverit, vel apoplexiam, vel dolorem, vel alios capitis morbos simulabit. Si nervorum systema, motus convulsivos. Si cor, palpitationes et angores. Si pulmonem, tussim, asthma, et reliquos illius morbos. Si colon intestinum, dolorem colicum pertinacissimum. Si renes aut lumbos, dolorem nephriticum ad amussim simulabit. Si vesicam, urinæ suppressionem. Si ventriculum aut intestina, vomitum et diarrhœam: et sic de reliquis."[a]

206. Many of these symptoms may occur unaccompanied by impairment of the general health; but in most cases this in some degree is present, especially with the last-mentioned complications; all the symptoms then become more or less

[a] Baglivi, *Praxeos Medicæ*, lib. ii., cap. v., § 2.

permanent, and constitute the disease usually known as aggravated hysteria, being that form described by Dr. Hall as "severe and inveterate,"[b] but which are best included under one general term, since they are only the same disease, of greater or less intensity.

207. If we bear in mind that the more prominent symptoms of cerebral affection would be classed by Hippocrates under other heads, the description left by that writer of the two forms of mild and aggravated hysteria is equal to any furnished by modern authors. He remarks, that "Nubile virgins, particularly about the menstrual periods, are affected with epileptic paroxysms, apoplexies, and groundless fears and fancies." He attributes these to a congestion about the heart and diaphragm, (noble parts,) predisposing the patient to delirium and insanity. "When these organs are oppressed, rigors and feverishness supervene; the patient raves about the acute inflammation, cries out on account of putridity; is terrified and anxious on account of her dimness of vision; and, from the oppression about the heart, thinks suffocation is impending. The mind is harassed by anxiety and weakness, and becomes diseased. The patients call out in great alarm, desire to leap down, or throw themselves headlong into pits, and order themselves to be strangled, as if it were a thing beyond all others to be desired. Spectres haunt them, and they earnestly long for death, as for a pleasure. Returning to themselves, the women consecrate their most valuable garments, as well as other things, to Diana, being cajoled into this by the injunctions of the priests. The disease is easily cured, if nothing retard the flow of the menses. To those young females affected by it, I recommend that they marry as quickly as possible, for if they conceive they will escape the disease. Unless this be done, they are sure to suffer from it, about or a little after puberty. The barren among married women are most liable to be affected by it."[c] In another part of these writings, (*De Morbis Mulierum*, lib. i.,) is a graphic description of the aggravated form; in this the ischuria, spinal and abdominal tenderness, tympanites,

[b] CV. p. 82. [c] De his quæ ad Virginem spectant.

aphonia, syncope, &c., observed in these cases, are all mentioned.

It might easily be shown that the ancients understood hysteric disorders better than some moderns; even the works of Whytt, Cheyne, and Pomme are much superior in every respect to the essays of Cullen and Good on these diseases; and it is only recently that Hall, Conolly, and Copland have done credit to that part of our medical literature, comprising the consideration of hysteria in all its varieties. Bradley, Brown, Teale, Darwall, Griffin, Marshall, and Tate have furnished materials of great practical value, but their peculiar opinions necessarily limit the utility of their works; while the general views of the other authors mentioned, fail to impress the practitioner with a distinct idea of the symptoms in detail, and of their more minute, and consequently less easily perceptible, relations.

208. The causes of hysteria, acting for the most part directly on the nervous system, produce all the characteristic symptoms of inflammation,—as increased temperature, redness, pain, spasm, and increased or diminished secretion,—without inducing the concomitant changes in the capillary system peculiar to inflammation; hence arises the great difficulty of instituting a correct diagnosis in many cases. A case of nervous asthma will assume all the characters of acute bronchitis, even in the pathognomonic sputa: if we have no other than the common principles of diagnosis, how shall we direct a suitable treatment, since the method of cure is so totally different in the two diseases?

Again, every organ is affected in hysteria; but the determination of what particular organs shall be affected, depends upon a variety of circumstances, such as the age, temperament, and pursuits of the patient; the hereditary liability of certain organs to disease; the state of the ovaria; the nature of the exciting causes, and many other secondary agencies and circumstances, complicating the subject in a manner which the routine practitioner would think impossible.

209. After much consideration it appears to me that the best mode of threading the labyrinth in which these diseases

are involved is, to avoid the usual scholastic method of treating them, and in place of considering their proximate, remote, predisposing, or exciting causes, their various modifications, and their general pathology, to examine into their physiological and pathological relations, taking as our guide the general principles of the division devoted to their special physiology. The field of inquiry will thus not only be enlarged, but clearer and more distinct views, both of theory and practice, will be elicited. General principles of diagnosis, prognosis, and treatment, may be then deduced; and lastly, each important symptom can be considered as a distinct disease.

CHAPTER II.

THE GENERAL RELATIONS OF THE NERVOUS DISEASES OF WOMEN TO GROWTH, DEVELOPEMENT, AND DECLINE.

SECTION I.

RELATIONS TO GROWTH AND DEVELOPEMENT, ANTECEDENT TO PUBERTY.

a. The first Dentition.

210. It is universally acknowledged that the affectability of the female sex has its counterpart in that of children; mental emotions and convulsive movements are excited in both with equal facility. That this excitability is not dependent upon the hemispherical ganglia is evident from the fact, that in early infancy, when the proneness to convulsive movements is best marked, we observe only the simplest mental phenomena,—those, indeed, which are purely instinctive, (181,) and consequently common to man with the lower animals.

That previously to puberty the cerebrum is in a condition differing from that which is observed after puberty, is further evident from the impulse given to the intellect on the accession of the latter; and the difference is still more obvious, when we consider the effects of cerebral injuries before and after adolescence. While these are among the most fatal injuries which can happen to the adult, in children their consequences are not more grave than those which would follow a lesson of corresponding severity in any other part of the body. This circumstance cannot have escaped the notice of the experienced surgeon; but Sir B. Brodie is the only one who refers to it: he remarks, "that the proportion of recoveries from wounds

of the brain is especially small in adult patients.[d] The statement is quite in accordance with my own observation; but, to render it more positive, I collected from various publications[e] eighty-one cases of injury of the brain, with a special reference to the proportion of recoveries at various ages. The following is the result:—

	Whole number.	Recovered.	Died.
Patients under 10 years of age	8	6	2
Patients between 10 and 15 (inclusive)	24	18	6
Patients between 16 and 21 (inclusive)	8	7	1
Adults of all ages above 21	41	14	27
Total	81	45	36

These various circumstances show, that in children the feelings and passions are not dependent upon the full action of the hemispherical ganglia. The results of an inquiry into the relations of the passions to the same ganglia in idiots, and the lower animals, would be exceedingly interesting.

211. The diseases of childhood are principally developed during dentition, a process which is well calculated to form a starting point of inquiry, because it represents with tolerable accuracy the progressive evolution of the mucous, muscular, osseous, and nervous systems, all which are advancing towards perfection. If the general developement be retarded, so also is dentition; if dentition be anormal, so is the evolution of the other structures; and we have rickets, infantile paralysis, or hydrocephalus. It follows, that painful or irregular dentition may be much oftener an effect, co-existent with convulsions, than a cause. Since the cerebrum and generative organs are both undeveloped, we can look for no symptoms specially involving these; but, excluding these two sources of excitement and of anomalous symptoms, we have all the remaining phenomena

[d] XLV. xiv., p. 417.

[e] The Medico-Chirurgical Transactions; Medical Commentaries; Annals of Medicine; Edinburgh Medical and Surgical Journal; Medico-Chirurgical Review; Abernethy's Surgical Observations on Injuries of the Head, &c., 2nd edition, 1815; Sir A. Cooper's Lectures, edited by Tyrrell, Vol. i. 1824-7; Sir C. Bell's Surgical Observations, Vol. i.; and cases from my own note-book.

of hysteria. Those usually mentioned by systematic writers may be enumerated as follows:—1. Those originating in organs connected with the upper extremity of the spinal cord: —*a.* Symptoms originating in the cranial cord; coma, watching, and sudden starting from sleep, increased sensibility of the surface,[f] general and epileptic convulsions, opisthotonos, paralysis. *b.* Symptoms implicating the face; strabismus, fixed stare, sardonic grin, trismus, convulsive twitchings. *c.* Symptoms referred to the larynx, trachea, and bronchi; aphonia, convulsive cough, hydrophobic gasp,[g] spasmodic closure of the glottis, croupy breathing, wheezing from increased or diminished secretion from the bronchi. *d.* Pharynx, æsophagus, and stomach; retching, vomiting, dysphagia,[h] eructation, impaired appetite. *e.* Heart; palpitation, syncope. *f.* Respiratory muscles; dyspnœa, sneezing, hiccup, yawning. 2. Symptoms implicating the dorso-lumbar portion of the cord:—Paralysis and tetanic extension and flexion of the lower extremities, serous exudation from the buttocks, increased micturition, ischuria, mucous discharges from the urethra, dysuria, constipation, diarrhœa, colic, tympanitic distension.

212. Systematic writers in general agree in making one or other of these symptoms the cause of the rest, the less grave having the blame of originating the graver; so that the protrusion of a tooth through the gums, constipated bowels, or flatus, have had the whole catalogue attributed to their injurious influence. That they are exciting causes may be readily granted; but if dentition necessarily caused such serious symptoms, why are they not observed in every infant? or at the second evolution of the teeth? or when the dentes sapientiæ appear? It is true that a constipated state of the bowels will excite convulsions in infants: but why more readily in infants than in adults? during the cutting of a tooth, than in the interval? or why, indeed, is there constipation at all? The true explanation is, that this state is itself a symptom amongst others, and is frequently premonitory of approaching

[f] Cruvelhier and Parrish, quoted in XV. i., p. 521. [g] CVI. p. 36.
[h] Mr. Kerr in VII. xlix. p. 345.

disease of the nervous axis; if neglected, it re-acts secondarily as a cause. So also dyspnœa, and depraved defœcation, which have been considered to hold to each other the relation of cause and effect, are in fact co-existent.

213. It is obvious that there is a peculiar state of the nervous system of infants, during dentition, analogous to that which accompanies the moult of young birds, (113,) the dentition of young mammals, as dogs and horses, the commencement of menstruation in females, and the return of each mensual nisus. A singular proof of this resemblance is afforded by the instances of precocious puberty which have happened from time to time; for in all it has commenced at or about the age of three years, that is, when the first dentition is completed; the intermediate period, and the second dentition, being passed over. If we separate one well-marked disease of infancy from the rest, we shall find how great is the resemblance to hysteric diseases in many points. The spasmodic or paralytic affection of the glottis, named laryngismus stridulus by Dr. Good, and so elaborately illustrated by the late Dr. Ley, will furnish an instance. This disease, like hysteria, may be accompanied by most of the infantile affections just enumerated; like the latter, also, it may be caused (or cured) by mental emotion,—as fright or grief,—by all depressing agencies, or by dental or other irritation. With equal constancy as hysteria, it attacks delicate, excitable habits, the exceptions to both being similar. Its paroxysms recur most frequently at night; it is hereditary, (according to Ley, North, Davies, and Pretty,) and, like other nervous diseases, is cured by change of air, moderate exercise, tonics, and the fetid and volatile stimulants. (Millar, Cheyne, Underwood, Marsh, Rosenstein, Ley, Darwall, Kerr.) It not unfrequently occurs in children independently of dentition.

214. The effects of dentition upon females after puberty, in exciting the phenomena of convulsive diseases, have been clearly elucidated by Dr. Ashburner;[1] and his interesting cases deserve attentive perusal. In such instances there is manifestly that predisposing state of the system, through which excitants, otherwise innocuous, originate an extensive

[1] XIV. Vol. xv.

series of morbid phenomena; and they afford another interesting point of resemblance in the analogy I am tracing between the evolution of the teeth and the phenomena of menstruation.

b. The Second Dentition.

215. The facility with which morbid poisons, as those of variola and rubeola, and, indeed, any irritation of the mucous surfaces, excite convulsions and other affections of the true spinal system, is singularly contrasted in children with the insensibility of the brain before mentioned. The general fact might be adduced in support of Dr. Hall's recent theory, that the brain is an exhauster of irritability. It is certain that as the insensibility of the brain diminishes, that of the mucous membranes increases, and in proportion to the growth of the individual; so that few of the symptoms which accompany the first dentition are observed in the second. Almost all writers concur in making this statement: the exceptions are observed, as might be expected, in delicate excitable children of retarded developement.

216. But a new set of phenomena appear at this period. The difference in the conformation of the sexes is now more strongly marked; some traces of puberty may be observed, and the male is obviously less excitable than the female. Convulsive affections assume a different and a more definite type, being epileptic in boys and choreal in girls. I ought to observe, that there are two very distinct forms of chorea; one (the common form) characterized by irregular movements, the other displaying combined movements, as the rotation and supination of an extremity, or of the whole body; or movements connected with tune and time: this form I shall term trochaic or rhythmical chorea.

Sydenham, Cullen, Hamilton, Clutterbuck, Elliotson, Thösink, Schäffer, and indeed almost every writer on the subject, have agreed in stating that this affection attacks youths between the ages of seven or eight and fourteen, or puberty. It has not been so generally remarked that the liability to the disease increases as the period of puberty approaches. The following interesting table, compiled by

M. Rufz, interne at the Hôpital des Enfans Malades, shows the fact very clearly.[k]

Age.	Males.	Females.	Total.
1 to 4	3	2	5
4 to 6	2	3	5
6 to 10	16	45	61
10 to 15	30	88	118
	51	138	189

Of seventy-six cases of chorea treated by Dr. Manson, fifty-four were in females,—a much larger proportion than in the above table. It ought to be observed, however, that the 189 cases occurred among 17,213 boys and 15,763 girls admitted into the hospital in ten years (from 1824 to 1834). If the number of girls had been equal to the number of boys, the number affected with chorea would have been proportionally greater, that is, 157; a fraction more than three-fourths of the whole number of cases, being the proportion stated by Heberden and Elliotson. Rhythmical chorea is much more rare than this affection, but the proportion of girls and women affected is greater. In epilepsy, according to the last-mentioned authors, the proportion of the sexes is just the reverse.

217. Chorea is the precursor of hysteria, but it usually disappears at puberty. It is a rare disease after that period, and, when occurring, has been usually re-excited by violent mental emotion,—as fright,—or has depended upon organic disease of the cerebellum. Like a paroxysm of hysteria or laryngismus stridulus, it may be cured by mental emotion, or induced by excessive depletion, as evinced in the jactitation following blood-letting. It will be found accompanied by the same general phenomena, *mutatis mutandis*, as accompany the first evolution of the teeth. There is spinal tenderness,[l] neuralgia, obstinate constipation, tender and distended abdomen, altered urinary secretion, and depraved appetite. It is frequently accompanied by other convulsive and spasmodic diseases.

[k] VII. xlii., p. 228, from Arch. General, Feb. 1834.

[l] Stiebel, XXXVII. iv., p. 505.

The symptoms appear also in a regular sequence. There are first movements of the eyelids and rolling of the eyes; then twitchings of the face, inarticulate speech, aphonia, sneezing, involuntary movements of the extremities, gradually increasing in intensity, and ending, if not checked, in tetanus, epilepsy, and idiotcy. It differs from the other diseases of childhood in this particular, that the fetid medicines are of little use,—mineral remedies, as iron, copper, silver, zinc, bismuth, arsenic, iodine, &c., being the most efficient.

Chorea, as regards both its symptomatology and pathological anatomy, has been considered by writers in general with very limited views. It is usually only a symptom co-existent with other phenomena which have been erroneously considered its causes; as, for example, constipation and spinal tenderness. So the mergence of the disease into epilepsy and idiotcy, and the various morbid appearances observed in the brains of those who have died of chorea, must be considered as the termination of a general disease, of which choreal movements, constipation, &c., are but the premonitory or initiatory symptoms.

218. I have thus attempted to trace the appearance of certain phenomena of hysteria through infancy and childhood to puberty, when the evolution of the sexual system establishes a series of special relations, originates new phenomena, and renders those more prominent which complicate parts having a functional or anatomical relation to the reproductive organs. I have dwelt more upon the subject than might seem necessary, but there are some useful and positive general principles which a shorter disquisition would have left in obscurity. We can now readily perceive that many of the phenomena of hysteria occur at other and earlier periods of developement than puberty; that each phase of evolution is characterized by peculiar phenomena; but that these are only specifically, not generically different. We may infer that the affectability of childhood is diminished in the male on the approach, and by the accession, of puberty; while in the female it is only altered in proportion as more vigorous vital powers influence the system, and becomes strikingly apparent so soon as those powers are depressed. We learn, too, that as dentition is not

always accompanied by convulsions or constipation, nor the period antecedent to puberty characterized by chorea, nor puberty or the menstrual period by hysteria, there are other and more general agencies by which this affectability is exalted. Perhaps the most common and most efficient of these is a hereditary predisposition to nervous disease, which taints as it were the whole stream of life, and is equally active in the convulsions of the infant as in the insanity of the man.

SECTION II.

RELATIONS TO THE PERIOD BETWEEN PUBERTY AND MARRIAGE; OR, BETWEEN THE AGES OF FOURTEEN AND TWENTY-ONE.

219. Chlorosis is one of the first diseases of the period which commences with the evolution of the sexual organs; but, so far as I have observed, very young chlorotic or anæmious females are rarely hysterical; not even presenting the morbid appetite so often accompanying chlorosis. In such cases the individual grows rapidly, but there is scarcely any action on the skin; the mammæ are seldom raised more than an inch above the surrounding parts, and there is no embonpoint or uterine secretion. When the generative organs are somewhat advanced in developement, and the blood contains a diminished quantity of colouring matter, we may expect with great confidence hysteria to appear in its milder forms. Should the individual so constituted have a reproductive system active in excess, the more threatening symptoms will be developed; and if excessive depletion be resorted to on the supposition that they are inflammatory, that state of the system termed spinal irritation will be set up, and its anomalous consequences.

220. In these cases the symptoms will vary accordingly as the patient is more or less developed. In the younger, there are seldom the more remarkable forms of the disease and the pelvic viscera are principally affected; it is only after the

mind has been cultivated and acquired some of the vigour of adult age, that delirium, somnambulism, catalepsy, and insane cunning display themselves. The propensity to destroy is also, I think, a disease of the later rather than the earlier periods of developement.

In the higher classes of society the females have seldom any regular and active employment either for body or mind, and are luxurious in their habits; there is also a precocious evolution of the system, so that these symptoms appear much earlier in them. But even in this case, they occur progressively, the pelvic viscera and the direct dependencies of the ovaria being the first to suffer; then the stomach, heart, lungs, and the parts supplied from the respiratory system of nerves; and, lastly, the brain and nerves of the senses are implicated. In the last-mentioned stage the previously local neuralgiæ and spasmi become merged in the general irritability, and are only indicated by the greater severity of the local symptoms. Lobstein, in his Treatise on the Sympathetic Nerve, relates a very interesting example of this ascending progress of the disease.

221. The hysterical temperament is now first well marked. The obviously hereditary proneness to convulsive paroxysms, and indeed to every form of nervous affection, is well worthy notice. It will affect the collateral as well as the direct branches of a family. I have observed it in the direct line, and a friend has two females under his care with spinal irritation, having the relations of aunt and niece. A relation of the Marquis of Anglesea, who is himself a well-known sufferer from neuralgia, had the same disease as his kinsman. A whole family has been known to suffer from epilepsy, and no one can doubt the hereditary transmission of insanity and eccentricity. Mere delicacy of system in the female is not the sole general predisposing cause of hysteric affections, since the severer forms, especially those which are paroxysmal, occur in otherwise robust and healthy females. But it will be found on inquiry that they are dependent on hereditary predisposition, as observed by Willis and Pomme, and really modifications of epilepsy, insanity, &c.

This hereditary predisposition to nervous diseases as a pre-

disposing cause of hysteria, has never been considered at length, or scarcely even observed. Voisin, however, details some very interesting cases in his work.[m] Thus it is stated of Mademoiselle Augustine L——, subject to anomalous hysteric paroxysms, that "she has four sisters affected like herself; her father is asthmatic, her mother subject to violent headaches," &c. Jean J——, suffering from aggravated hysteria and all its anomalies, "has an uncle and an aunt who are epileptic; her father and mother are subject to violent headaches, her father is passionate, violent, obstinate, and she is like him; she was a spoiled child," &c. Mademoiselle B——'s mother "is subject to frequent headaches, her sister has had four nervous attacks, and she herself is plainly of the nervous temperament," &c. Mademoiselle Angelique-Marie M——, with epileptiform and aggravated hysteria, "has one cousin an idiot, another with suicidal monomania, a brother who is deaf, and five other relatives who are blind," &c. Marie-Charlotte R——'s mother is subject to violent headache; an aunt and a cousin, the one epileptic, the other hysteric, are, like herself, in the Salpêtrière," &c.

222. The relations of hysteria to the present modes of education are of great importance. The anxiety to render a young lady accomplished, at all hazards, has originated a system of forced mental training, which greatly increases the irritability of the brain: sedentary employments, as drawing, embroidery, &c., are followed frequently as amusements, to the exclusion of active exercise out of doors. The slow but powerful influences of music, dancing, vivid colours, and odours, on the nervous system, but especially on the reproductive system, (128, 129, 130,) is quite overlooked; three or four hours of severe application are occupied in the acquisition of a brilliant mechanical performance of some difficult and elaborate pieces of music on the piano-forte, which are forgotten as soon as possible after marriage when it would be least hurtful, or rather most useful. Dr. J. Johnson very justly asks, "Is it probable that so potent an excitant as music can be daily applied for many hours to the sensitive system of female

[m] CXXIV. p. 210, seq.

youth, without producing extraordinary effects? Is it not likely to inflame the imagination, and disorder the nerves?" and adds with great truth, that "the stimulus of music is of a very subtle and diffusible nature, and the excitement which it produces in the nervous system is of a peculiar character, by no means generally understood." It is well known that many mammalia, as cows, deer, horses, &c., are exceedingly fond of music; even reptiles, and perhaps insects, delight in it. Mr. Schönburgh remarks that the boys of the West Indies take advantage of the liking which a common lizard, the *anolius bullarius*, has for music, and arrest its attention by whistling to it; they can then throw a noose over its head:[n] the Rev. L. Guilding corroborates this statement.[o] The reader is also referred to paragraph 130 for further illustrations. The baleful effects of musical studies on the mind and passions is certainly not suspected at all by many excellent mothers.

223. Young females of the same age, and influenced by the same novel feelings towards the opposite sex, cannot associate together in public schools without serious risk of exciting the passions, and of being led to indulge in practices injurious to both body and mind. Dr. Copland observes that "whenever numbers associate previous to or about the period of puberty, and especially where several use the same sleeping apartment, and are submitted to a luxurious and over-refined mode of education, some will manifest a precocious developement of both mind and body; but in proportion to precocity will tone and energy be deficient, and susceptibility and sensibility increased."[p] Frequently, too, the daily exercise is little more than a lounging walk in two and two file, and consequently the sensory system becomes charged (as it were) with excitability, for nothing diminishes the affectability of this system so much as labour, or exalts it so much as indolence.

224. The consequence of all this is, that the young female returns from school to her home a hysterical, wayward, capricious girl; imbecile in mind, habits, and pursuits; prone to hysteric paroxysms upon any unusual mental excitement,

[n] XXXII. xvii., p. 560. [o] XXIX. vii., p. 583.
[p] VIII. art. Hysteria, § 49.

and yielding to them, until at last she will "die twenty times on the poorest moment," and, like Cleopatra,[q] has acquired "a facility in dying."

The robust unmarried female, in easy circumstances, may escape many of these evils: but after the age of eighteen the reproductive organs are fully—probably largely—developed, and strong passions, indolence, and luxury, fail not to produce their effects on the system, and to develope the sthenic form of hysteria. It is to such that marriage, as recommended by Hippocrates, and his copyists, Forestus, Hoffmann, Boerhaave, Duvernay, Pinel, Esquirol, Villermay, and most of our own writers, is so useful; although doubtless the asthenic forms are sometimes benefited by this procedure; the ovaria being excited to the performance of their proper function, and the cares of life dispelling the "vapours" so apt to congregate about the idle and well-fed.

After the young female has returned home, and is introduced into mixed society, she is more than ever exposed to influences acting injuriously on the nervous system. The excitement and competition of social life, excited love, ungratified desire, disappointed vanity as well as affection, late hours, long and late indulgence in sleep, and the excessive use of stimulants, as wines, liqueurs, coffee, tea, &c., all act with more or less of combined energy upon the unfortunate young lady in fashionable life. Nor ought the effect of dress to be overlooked; for the waist (in despite of all warnings) is frequently compressed into the most preposterously diminutive proportions, and the circulation through all the important viscera retarded. Even free muscular action is impeded, and each elevation of the arm endangers the rupture of some of the bands, or laces, or straps which maintain her slender elegance of form. The mammæ are compressed (if beyond the fashionable magnitude) and irritated, and re-act upon the ovaria and uterus; while these last are further stimulated by the heat caused by the masses of padding appended to the loins. When we remember that both the reproductive and general systems are nearly at their climax of developement, the injurious effects of such agencies can be easily conceived.

[q] Antony and Cleopatra. Act i. Sc. 2.

SECTION III.

RELATIONS TO THE PERIOD BETWEEN THE AGE OF TWENTY-ONE, AND THE CESSATION OF THE CATAMENIA.

225. The preceding remarks are applicable to unmarried females until middle age; but certainly the married rarely suffer from distinct nervous affections, unless they are most delicately organized, or have some hereditary predisposition, or are married to a husband physically incongruous.

Many of the organs affected in hysteria are affected during pregnancy, (43, 66, 69,) and local neuralgiæ, aphonia, and hysteric and epileptic paroxysms make their appearance. They very frequently originate in maternal emotions; and the aberrations of mind of puerperal women are most usually connected with their offspring. When the married female has no children, the symptoms are more commonly those of the paroxysmal or inveterate form, than of the mere hysterical diathesis, although this last is not unfrequently present.

226. The vigour of the reproductive system begins to decline about the age of forty or forty-two; and from this period to the age of forty-nine, there is a state of system exceedingly analogous to that of the period during which it was first developed. The morbid phenomena are, however, favourably modified by circumstances. Age has blunted the sensibilities in some degree. There is less of passion, less disappointment, less mortified vanity, and fewer causes for indulgence in evil tempers and foolish caprices; while those mental ills which unavoidably happen are soothed by more or less of religious feeling. The hysteria is of the sthenic or cachectic type; the uterus and mammæ, or, if the patient have not had children, the thoracic viscera are principally affected; asthma, angina pectoris, menorrhagia, neuralgia of the mammæ, and their concomitants, are observed; and when the catamenia cease, if the health be not re-established, gout, hypochondriasis, or general cachexy, supervenes, and cancer attacks the reproductive organs or their glandular appendages.

CHAPTER III.

RELATIONS OF THE NERVOUS DISEASES OF WOMEN TO THE UTERUS AND OVARIA.

227. SINCE so much has been written on the uterine origin of these diseases, their relations to the uterus and ovaria must have a passing notice. It is plain, however, from the preceding statements that these organs have rather a directing than an exciting influence on nervous affections; and that when they are the seat of the exciting cause, the morbid changes they will exhibit will rather resemble those induced by conception, than by organic disease.

Now such is the fact; for the most constant appearance observed in the bodies of those who have died of hysteria has been enlargement of the ovaria, accompanied with vesicles containing an albuminous fluid, or resembling the Graafian. Such were the appearances observed by Villermay in a young female who died of hysteria induced by fright;[r] and the same author cites Riolan, Blancardus, Binninger, Vesalius, Diemerbroeck, and Morgagni, as having witnessed somewhat similar changes.

228. Pujol and Broussais attributed hysteria to chronic "phlegmasie" of the uterus. Dr. Billing says, "I consider the cause of hysterical symptoms to be chronic hysteritis, yet by no means frequently requiring the sedative or antiphlogistic treatment."——"The chronic hysteritis producing hysteria is often as slight, though not so transitory, as that which Hunter showed to accompany conception," &c.[s] Now, all these appearances may originate in irritation of the spinal ganglia or the cerebellum, and in many cases are the effect, and not the cause, of the disease.

[r] XLII. xxiii. [s] CXXI. p. 134.

CHAPTER IV.

RELATIONS OF NERVOUS DISEASES TO PERIODIC MOVEMENTS.

SECTION I.

RELATIONS TO PERIODIC MOVEMENTS DEPENDENT ON COSMOLOGICAL INFLUENCES.

a. General Remarks.

229. By reference to the previous observations on this subject it will be obvious that each day, week, season, and year, brings its distinct and regularly recurring influence to bear upon vitalized systems. The quotidian changes excited in the latter, and the laws by which they are regulated, are almost unknown. It is true, A. I. Testa's work on the periodic changes in the human system [t] contains some reference to the subject; but as the electric, magnetic, and other variations in the earth and atmosphere lately discovered, and found to be principally dependent on the course of the sun, were entirely unknown at the time he wrote, his mode of treating the subject is exceedingly superficial, and has no bearing upon practice. The observations referred to are those of Horsburgh, Humboldt, Boussingault and Rivero, Carlini, Lubbock and Hudson, on the diurnal variations of the barometer; of Colonel Sykes on the same subject, in connexion with the daily tides of the atmosphere; of Saussure, Schubler, and Read, on the same subject, and the diurnal changes in the electric tension of the air; and those of Canton, Beaufoy, Hood, Christie, Barlow, and Fisher, on the diurnal variations

[t] CVII. Bk. ii., pt. ii. ch. i.

of the magnetic needle. They present a set of new and most important relations to the diurnal changes in vital organisms which I hope shortly to place before the public, in a tangible and practical form. The hebdomadal changes have been noticed from an early period of the medical art; probably by the ancient Egyptians. On these Pythagoras founded the application of his doctrine of numbers to medicine; and their influence on disease, and some of the laws of their recurrence, were subsequently the basis of the doctrine of critical days. Connected with these weekly periodic movements was the opinion of the moon's influence on the system, which is equally founded on observation. I would only remark here, that the time of each new and full moon, and of each change, are the central points of the lunar influence, as the equinoxes and solstices are of the solar influence. The menstrual must be considered, for the reasons before given, (87,) as nothing more than a multiple of the hebdomadal period.

b. The Quotidian Changes.

230. The quotidian, and its analogue, the tertian form of hysteria, has the same generic character as other intermittent diseases, the class of nervous agues forming the connecting link. In these latter, the paroxysm is marked by certain distinct affections of the nervous system, as catalepsy, catochus, tetanus, delirium, &c.

The local neuralgiæ and spasmi of the hysterical which assume the intermittent character, have their analogue in the class of local agues, in which a limb, a segment of the trunk, or a lateral half of the body only is the seat of the symptoms distinguishing a general intermittent affection. Macculloch relates many interesting cases of local nervous disease; Höchsteller and Riedlin relate instances of quotidian paroxysms of yawning in girls;[u] a case of quotidian paroxysmal laughter is recorded in the Gazette de Santé, No. xviii.[v] The following is interesting, as connecting these cases with the doctrine of critical days:—A lady who had the catamenia arrested by some melancholy news, had a paroxysm of hiccup at intervals of

[u] XI. i., p. 633. [v] XCIII. i., (N.S.) p. 485.

twenty-four hours, which continued for thirty-six.[w] In a similar case the hiccup alternated with aphonia. These cases will be frequently accompanied by a hysteric paroxysm, and sometimes the latter, uncomplicated by any local affection, occurs at quotidian or tertian intervals,[x] constituting a hysteric ague. In the local intermittents the same cause is acting as in the general affections, but in passing through the system developes disease only in those parts, the nervous centres of which, from some local cause, are less able to resist its influence, or are more susceptible of slight impressions. It is thus that the nerves passing through bony or cartilaginous foramina, as the different branches of the fifth, of the intercostal, the suprascapular, and the sciatic, are so often the seat of an intermittent neuralgia. (195.)

231. The above general remarks leave the quotidian intermittent forms of nervous disease to be explained and elucidated by the pathology of intermittent diseases in general, no reference being made to the periodic influences caused in each day by the sun's varying power. The daily changes in the body during sleeping and waking are too important, however, to be left unnoticed. The commencement of sleep is really the commencement of a temporary paralysis of the nervous system, which becomes more and more complete, as the sleep becomes more profound. When, during this period of natural paralysis, the functions of the nervous system are normally performed, all is harmony; but should there be local disease, symptoms quiescent during the day threaten so soon as sleep and its accompanying paralysis begin, and burst out in all their intensity at one or two o'clock in the morning, when sleep is most deep. It is thus, that the occurrence of the attacks of gout, of epilepsy, asthma, paralysis, and other nervous diseases at this hour are readily explained; it is thus we can explain the "jumping," during the night, of a limb in which there is disease implicating the nerves, as in diseased hip or knee; and the more frequent recurrence of delirium and other affections of the brain during the hours usually passed in sleep.

232. Every vital act is more easily performed the oftener it

[w] XCIII. ix. [x] M. Solly, XCIII. ix. (N.S.) pp. 334, 531.

is repeated; and this general principle applies equally to the functions of the visceral system as to those of the motor and sensory. This is demonstrated in the regular daily recurrence of the appetite for food; the desire to evacuate the bowels and bladder; the waking from sleep, or desire for sleep; all coming on day after day at precisely the same hour. Such being the law of the natural movements, the inference is easily drawn that diseases recurring from some temporary exciting cause or causes, at a fixed hour every day for a few days in succession, will, when the primary causes have ceased to operate, still continue to recur daily at the same hour. And this is actually the case in many periodic affections, particularly in obstinate agues, which have been frequently cured by some extraordinary moral circumstances breaking the habit,—as fright, joy, disgust,—or by any nervine alterative, whether physical or material.

c. Atmospheric and Seasonal Changes.

233. Nervous diseases are continually influenced by atmospheric changes. Every delicate invalid knows the effect of an east wind upon his comfort. It finds out every weak place in such people; a broken bone, a rheumatic or diseased joint, or a neuralgic nerve, will instantly give notice of often the slightest change in the wind to the east. A patient under my care with facial neuralgia, knows the changes which have occurred during the night in the direction of the wind, from his sensations alone. I have observed repeatedly a general complaint of a bad night, and much more pain, when I have visited the wards of the York Hospital after a nocturnal change in the wind. A very curious illustration of the effect of variations of the weather on the nervous system is presented by the fact, that some naturalists have described the peculiar cry or singing of an invisible bird which they heard in the night invariably before change of weather. An intelligent naturalist attributes this note to the tinnitus aurium excited in the diseased auditory nerve by changes in the atmosphere. He suggests a gamut of notes which should indicate each change; and remarks that the very high tones usually indicate rainy weather. But he himself hears every

variety of sound.[y] Now, the greatest atmospherical changes occur about the changes of the moon; Mr. Lubbock says the barometer is highest at the new and full moon, and lowest at the quadratures;[z] Toaldo's observations presented the same result, but those made at the Paris Observatory precisely the reverse. The general fact, however, remains untouched. To deny the influence of the moon on vital organisms, is in fact to deny that atmospheric changes have any effect,—a contradiction belied by every day's experience. That state of the atmosphere in which thunder-storms prevail most, has a remarkable effect upon nervous people. In one of my patients it excites diarrhœa and cephalæa; in some it produces clavus; in others a sensation of heavy weight on the vertex, of general uneasiness, of intense headache, and occasionally dyspnœa, and even the phenomena of an ague fit. The general lassitude experienced is well known.

234. The vernal and autumnal—or, more properly, the equinoctial—occurrence of hysteric and other diseases has been already noticed, (119, 120,) and illustrations from natural history in elucidation of the general principle have been given. (108 seq.) It will be curious to observe whether the attacks of hysteria are also more frequent about the solstices; the sexual moult of birds at the summer solstice, at least of those which have a double moult, might lead to the suspicion that this actually occurs. This is further rendered probable by the statement of Pinel to the effect that paroxysms of insanity frequently occur at the summer solstice.[a]

SECTION II.

RELATIONS TO THE WEEKLY PERIODIC MOVEMENT.

235. The doctrine of a periodic monthly change in the system of the human female is so universally known and acted upon as to require little notice. It must be stated,

[y] XXIX. vi., p. 185. [z] XXVII. for 1831, p. 227. [a] CIX. p. 12.

however, that, according to the general inferences deduced in the first part of the work, this period is only a multiple of the hebdomadal period, and consequently that changes occurring every three-and-a-half and every seven days, as well as every two, three, or four weeks, come under this head. The quartan ague (an autumnal disease) is, more frequently than any other intermittent accompanied by a distinct nervous disease. Both Stoll and Rondeletius mention the complication of catalepsy with fever of quartan type.[b] Dr. Craigie mentions numerous varieties.[c] The possibility of hysteric disease assuming this type should not be overlooked.

236. The fourth day, and the seventh, eleventh, and fourteenth are critical days, and connect the doctrine of crises with the menstrual period. The return of nervous diseases on the seventh day has been rarely noticed. Sir B. Brodie has related an instance of a hebdomadal paroxysm of sneezing.[d] There is a case of ophthalmia which assumed this type, related in the Medico-Chirurgical Transactions, (vol. iii.,) and another in the Journ. Complementaire, for January, 1830. Mr. Melin has reported a case of iritis recurring every seventh day.[e] There is also on record a case of amaurosis of the same type.[f] Nor has the recurrence of nervous affections every fourteenth day been often observed. Dr. Seymour mentions, among other instances of heptal periodicity, the case of a woman who would be in high mania for a fortnight, and then low for a fortnight.[g] A boy aged sixteen came under my care, who had been subject to epileptic fits for the last six years. The paroxysms were not always alike; sometimes he fell senseless, and was not convulsed; sometimes was horribly afraid, or had choreal movements, or was irresistibly compelled to run forwards. The most singular circumstance was, that they returned at regular periods; either every fortnight, or on the fourth day before, or on the fourth day after, so that he could anticipate the time of an attack with some exactness. In an early volume of the Philosophical Transactions,[h] there is a case detailed in which an individual had convulsions, at first every fortnight,

[b] XLIII. Pars vi., p. 215. [c] CVIII. i., p. 65. [d] XIV. xix., p. 249.
[e] L. for Oct. 1824. [f] XCIII. vii., p. 227. [g] XIV. xix., p. 154.
[h] Abridg. iii., p. 198.

then twice a week, and at last upon any excitement. The paroxysms recurred for thirty-six years.

237. Just as the menstrual discharges occasionally do, so will paroxysmal diseases recur every three weeks. Dr. Prichard had a patient, a blacksmith, in whom the epileptic paroxysm returned every three weeks; if the usual period elapsed without a fit, then it did not occur until the termination of six weeks.[i] A tiler, after a fright, had epileptic fits, which recurred at first every three weeks, then every month.[k] Many instances of this kind, both in men and women, might be mentioned, not only demonstrating the law of periodicity, but also that it is as applicable to males as females. Thus, the hysteric paroxysm has recurred monthly in a young man.[l]

238. It is exceedingly useful to notice these periodic movements in the treatment of hysteria. They may be observed in every grade of intensity. A patient will complain of the medicines disagreeing with her, and of increased indisposition, on one or two days in each week, and a practitioner, forgetful of the general law, might be induced to discontinue the use of a valuable remedy, and form a very erroneous estimate of its powers. On the other hand, apparently urgent symptoms may be met by active measures, to the great injury of the patient; which, if left to themselves or treated by palliatives, would cease spontaneously, as certainly as the ague paroxysm. Such instances have come under my own notice.

[i] VII. xi., p. 461. [k] Ibid. [l] XCIII. xviii., p. 207.

CHAPTER V.

RELATIONS OF NERVOUS DISEASES TO ALTERATIONS IN THE COMPOSITION OF THE BLOOD.

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239. The statements of this chapter are rendered in some degree necessary by our previous views respecting the composition of the blood of females. (138.) It is not intended to review all the extensive relations which nervous diseases bear to the composition of this fluid, but only to notice those points which are practically useful, or may lead to more enlarged views or more correct observations. These points are the effects of blood-letting, and other exhausting agencies, of certain poisons which act by entering the circulation, and the phenomena of gout, considered as being caused by a *materies morbi* circulating with the blood.

SECTION I.

THE EFFECTS OF BLOOD-LETTING AND OTHER EXHAUSTING AGENCIES.

240. The convulsions and hiccup excited by great loss of blood were noticed by Hippocrates. Boerhaave mentions it in his list of the causes of convulsions, and Van Swieten in his comment remarks that slain animals afford daily illustrations of the fact, as well as parturient females who have suffered from flooding. Willis, Whytt, Armstrong, Kellie,

Andral, and Hall have made similar observations upon the subject.

The effects of profuse loss of blood are always most obvious in females and delicate males. In the first stage there is syncope, convulsions, profuse perspiration, vomiting, relaxation of the sphincters, increased micturition, diarrhœa; in the second, pain and throbbing of the temples, sense of weight in the vertex, irregular action of the heart. In the words of Dr. Hall, "the respiration is affected in different cases with panting, heavy sighing, heaving, blowing, moaning, gasping, catching, &c. There is in some an irritative cough in violent fits or in the form of perpetual hacking, apparently arising from an affection of the trachea. The stomach is liable to be affected with retching, vomiting, hiccup, and eructation; and the bowels, even in cases in which they were not previously disordered, become variously deranged with constipation, diarrhœa, and flatulence. In some cases there are various spasmodic affections; in other instances, catching pains, which are apt to be mistaken for inflammation. Every source of disturbance, or of anxiety, or of alarm, and every effort, whether of mind or body, is apt to be followed by a return or exasperation of the symptoms."[m] There is morbid sensibility of the skin and senses in general, according to Andral;[n] and he therefore forbids the application of blisters to the surface of those who have been copiously bled. In the third stage, jactitation or choreal movements, delirium, paralysis, blindness, deafness, slight insensibility increasing to apoplectic coma, jerking of the legs, relaxation of the sphincters, diarrhœa or constipation, tympanitic distension, and retention of urine:—in a word, all the symptoms which characterize a case of aggravated hysteria, as detailed by Pomme, Darwin, and others, in monographs and the medical journals. There are practitioners not familiar with such cases, whose treatment would be to bleed, and repeat the bleeding again and again; and who, failing the lancet, would leech the side, the abdomen, the temples, as if there were the most intense inflammation; destroying their patients by

[m] CV. p. 226. [n] Lectures in XIV. xvii., p. 586.

the very means adopted (doubtless with the best intentions) to alleviate them. Extremes in theory and practice are always injurious; but systematic empirical eclecticism in medicine is infinitely more so, because it degenerates into a frigid routine fatal to all progress in medicine. A practitioner imbued with it acts strictly according to the law of his text book: if his patient is cured, well;—if not, he has done his best, and cannot help the failure; every thing recommended by "the best writers" for phrenitis, or peritonitis, or spasms, has been done.

241. It is scarcely necessary to remark, that all causes which reduce the powers of the system produce effects similar to those following loss of blood. These need not be enumerated; but it should be remembered that the consequent effects are of an importance proportionate to the strength of the individual as well as to the efficiency of the cause; so that dangerous and unmanageable symptoms might be developed in very delicate individuals by but slightly depressing agencies.

SECTION II.

EFFECTS OF CERTAIN POISONS.

a. Exanthematous Poisons.

242. MANY forms of convulsive disease have been excited in children and young females by the contagion of small-pox, measles, fever, &c. Dr. Stoker relates, in his Pathological Observations, the case of a young female, to whom he was called when she was apparently moribund. The powers of speech, of swallowing, or of performing any kind of voluntary act, were totally suspended; complete paralysis of the right side had taken place, and convulsions continually agitated the left. Suitable measures were sedulously adopted, and blood at last began to flow from a vein which had been opened on the first onset; the patient was enabled to sleep tranquilly, and on awaking, every symptom of nervous disease had dis-

appeared; but there was a high degree of pyrexia. On the fourth day from the first attack the measles appeared, accompanied by the usual pulmonary affection. Dr. Conolly has mentioned interesting instances of this class.[o]

It may be observed in this place, that the commencement of many of the worst cases of hysteria is traced by the patient and her friends to some febrile attack about, or a little before, puberty;—most usually typhus fever, sometimes "brain fever," sometimes scarlatina. There are many chronic nervous diseases which have unquestionably been the consequences of fevers of a typhoid type,—as deafness, partial paralysis, &c.; and in the cases alluded to, it is probable some analogous changes in the cerebro-spinal system have been developed during the progress of the fever, and that these have gradually evolved themselves, and drawn on a long series of varying affections of the nervous kind.

b. Metallic Poisons.

243. The action of the mineral poisons, mercury, arsenic, antimony, iron, gold, lead, silver, zinc, bismuth, and iodine, on organs implicated in hysteria, and on the nervous system in general, in causing and curing paralytic, spasmodic, and neuralgic affections, is a subject of the highest importance and interest. There appears a general similarity in their effects, while they differ in their action on individuals, and on particular organs. Thus antimony and arsenic act specially on the stomach; mercury and arsenic on the generative organs and their appendages; mercury, gold, antimony, and bismuth, on the salivary glands; zinc, arsenic, and antimony, cure malarious diseases; iron, silver, copper, and arsenic, cure chorea and epilepsy, and even hooping-cough; and the greater number cause neuralgia and paralysis, particularly mercury, lead, and iodine.

c. Animal Poisons.

244. Those which require to be noticed, are, the poison of a rabid dog, of certain arachnida, and of the blistering fly

[o] XV. ii., p. 564.

(*cantharis*). In addition to the well-known effects of cantharides on the genito-urinary organs, "an affection of the throat, causing difficult deglutition, and even an aversion to liquids, appears to be pretty constant."[p] An instance is related in the Transactions of the Academy of Turin, in which tetanic convulsions and hydrophobia appeared three days after a small dose of tincture of cantharides was taken, and continued for several days with extreme violence; tetanus was induced by a slight touch. In a boy who took an ounce of the tincture by mistake for laudanum, general convulsions came on at intervals. During the remission he was insensible, and his limbs would retain for any length of time the position in which they were placed. He had something like "clairvoyance;" for, although he seemed to recover, he predicted the day of his death, (the seventh from that time,) and on the day mentioned, the convulsions returned, and he died.[q]

245. *Hydrophobia.*—With regard to the symptoms of spontaneous rabies in the dog, there appears little resemblance between them and those observed in animals bitten. The rabid dog has none of that exquisite sensibility which is so prominent in the latter. Its temper is irritable, appetite wanting, or so depraved that it will eat its own excrement; the conjunctivæ are injected; there is a flow of saliva, attempts to vomit, inability to pass urine and fæces, and paralysis of the head and legs. But in poisoned pigs Mr. Gilman found the symptoms remarkably modified. These had inflamed conjunctivæ, rigors, and paralysis of the hind-legs, and anhelation and violent convulsive movements on attempting to take food or drink, or on the slightest mental excitement, as that produced by stamping on the ground at a distance from the animal; in short, exquisite sensibility, inducing violent muscular action on the slightest stimulus. In dogs then the poisonous matter is a morbid secretion, producing symptoms widely different in the animal inoculated by it, than in that affected idiopathically by the disease termed rabies.

The principal cadaveric phenomena noticed by Mr. Gilman

[p] CX. p. 456. [q] XIV. xv., p. 320.

in pigs and dogs, and by Dr. Herbst of Göttingen in dogs, were in organs connected with the respiratory ganglia. In pigs there was inflammation of the under surface of the œsophagus; in dogs, of the parotid and salivary glands, the uvula, fauces, under surface of the epiglottis, pharynx, œsophagus, and stomach.

246. In man, the first circumstance noticed is the extreme affectibility of the nervous system, which commences with pain in the wound. A painful sensation is next felt about the throat,—a symptom constantly accompanying all envenomed wounds; and a distinct power to listen to sounds, and detect smells, which no one else can observe: light is distressing, and the skin, particularly of the scalp, is very sensible to impressions; a tickling sensation is then perceived, which shortly becomes actual pain, and is succeeded at last by anæsthesia. There is also mental irritability; dyspnœa and convulsive movements are excited by the least noise, as a whisper, or by a current of air, or on the sight of certain colours, or of brightness. The eyes are bright and rolling, the angles of the mouth retracted; there is a flow of saliva, spasm at the root of the tongue, pain and enlargement of the thyroid gland, pain in the throat, violent cough, laryngeal spasm and anhelation on the slightest excitement, very quick pulse, nausea and vomiting, flatulent distension of the stomach and bowels, urine milky, and passed involuntarily. Paraplegia, delirium, impaired senses, general tetanic spasm or convulsions, and apoplectic coma, precede death.[r]

247. These symptoms are not of course to be expected in each individual case. Those parts of the nervous system most exercised by the patient in his own proper pursuits, or already in a state of under tone, will be the first to suffer. Thus sounds will probably most affect the musician, colours the painter, &c. The constancy with which the pharyngo-laryngeal surfaces

[r] This account is taken from Gilman's, Parry's, and Bardsley's respective works on the subject, especially the article by the latter in the Cycl. of Pract. Med. ii., p. 483; cases reported in the Med. Chir. Trans.; the Edin. Med. and Surg. Journal; the Lond. Med. Gazette; the Lancet; and in Dr. Herbst's communication *Uber die Wasserscheu*, inserted in Holscher's Hannoverschen Annal. der gesamt. Heilkunde Bd. iv., Hft. i.

are affected, and the phenomena resulting from their increased sensibility, have imparted the peculiar name to the disease. It may however occur, and prove fatal, without there being any hydrophobia whatever. It is really dependent upon a morbid poison, and its phenomena should be classed with those resulting from the bites of arachnida, and other venomous animals, and from the use of strychnia, opium, or arsenic. The most remarkable fact is, the great similarity between the symptoms of hydrophobia and those of excessive blood-letting and hysteria; every one of those enumerated being observed in cases of the latter.

248. *Tarantism.*—Cases of tarantism are instances of poisoning by the bite of a scorpion, or tarantula spider; the peculiar symptoms, as choreal movements, dislike of colours, &c., being developed amongst the Italians more particularly, on account of their peculiar amusements. In many cases, therefore, these are not excited; for just as arsenic, belladonna, and other poisons, produce different symptoms according as the dose, the individual's idiosyncrasy, or other circumstances vary, so also does the poison of the tarantula; it does not necessarily excite rhythmical chorea, no more than arsenic necessarily excites vomiting. A young Tuscan, aged fifteen, was bit on the second toe of the left foot by a tarantula. The toe inflamed, the patient's penis became erect, the abdominal muscles assumed a state of tetanic contraction, the extremities were convulsed, the countenance had an expression of terror, the skin was cold and moist, the strength prostrated, and there was an irresistible tendency to sleep. The patient was cured by stimulants. The description left by P. Ægineta of the effects resulting from the bite of a scorpion is exceedingly applicable to this case; "arrectio membri" is particularly mentioned;[s] and the whole account is corroborative of the interesting essay of Baglivi[t] on this subject.

249. This dissertation bears evident marks of the cautious philosophy which distinguishes the other works of its author. He gives the natural history of the tarantula spider, illustrating it by plates; he dissected the insect, and distinguished its varieties; he experimented upon dogs, and he inquired

[s] X. Lib. v., cap. 8. [t] CXI.

most minutely into the symptoms produced by its bite, when inflicted on man. Baglivi justly remarks, that the symptoms of tarantism are closely analogous to those of melancholia, chlorosis, and similar diseases; that those principally affected are females, and that the Tuscans in general are "macilenti, impatientes, iracundi, insomnes," or of an irritable nervous temperament; that the tarantula produces its most remarkable effects during the hottest days of summer, and that it is harmless when removed to a colder climate.

250. The symptoms first observed, are those of a malignant fever, "cum coagulatione;" there is a sense of strangulation, and an almost fatal depression of the vital powers; suffocation seems impending; the lips and cheeks are livid; the wound is surrounded with a livid circle; there is numbness and tremors of the limbs, or great sensibility of the surface, aphonia and spasm of the tongue. When the *uvea tarantula* has inflicted the bite, in addition to the symptoms just enumerated, there is pain and swelling of the part bitten; spasms, rigors, and general cold sweats, with aphonia, frequent vomiting, dyspnœa, and sense of impending suffocation, tympanites, and erection of the penis. If the patient recovers without dancing, the disease will return in the following year, and he is affected with febricula, yellowness of skin, loss of appetite, oppression at the epigastrium, &c.; and if he eat mutton, cucumber, or melon, he is immediately seized with a sharp pain of the stomach.

251. Then with regard to the rhythmical chorea, for which the *tarantati* are so celebrated.—In the first place, the whole matter has been much exaggerated, like every thing else which ignorant people cannot account for. It appears from Baglivi's history, that the individuals bitten do not show the propensity to dance unless music be played in their hearing, and then each patient must hear his own favourite tune; so that the musicians have sometimes to play three or four tunes before any effect is produced. Rapid tunes are the most enlivening to them, as they are, I suspect, to most dancers. The first effect of the music is to mitigate the symptoms; the patient then moves first his fingers, next his hands, feet, and legs, and at last, leaping up, begins to dance, which he continues to do

for a length of time without weariness. A slight discord (of which country clowns, previously quite ignorant of music, are very susceptible) will excite constriction of the chest, gasping, and sobbing. The sight of any thing black will have the same effect; but that of naked swords, or of scarlet, red, and blue, gives them pleasure; sometimes the patients show symptoms of nymphomania, or run forwards, or revolve on the ground, appear to be intoxicated, or as if they had lost their senses, do not notice their friends, &c.

252. Are not these symptoms quite analogous to many well-known toxological and hysterical phenomena? Compare some of them with the effects of the inhalation of nitrous oxide—the pugnacity, the laughing, dancing, tossing of the arms, somnambulistic appearance, and insane demeanour, developed for a few minutes according to the habits and temperament of the individual. The pugnacious will "hit right and left" after the first burst of laughter, but the frequenter of the ball-room "foots it featly," and with inimitable grace. At the first onset, the heart and respiratory system of the *tarantati* are nearly paralysed by the poison, just as occurs after a large dose of opium, or other narcotic poison. The affectibility of the nervous system is at the same time exalted; so that the susceptibility of being impressed by musical sounds, and the proneness to choreal movements, differ merely in kind from the increased susceptibility to the effects of certain colours; and the dancing, so readily excited, by keeping up the action of the heart and vascular system until the poison is eliminated, does that for the *tarantati* which the muscular movements excited by nettles and stripes effect for the narcotized. This means of cure might be applied with considerable prospect of success to other cases of poisoning, as by the bites of venomous reptiles, or by some vegetable poisons, particularly belladonna and stramonium. It would be of importance to commence the treatment early, to select a favourite air, and to have it performed in quick tune, on an instrument connected with old and familiar associations, or national feelings. Even in cases of hysteria, where active exercise is necessary, —and these are numerous,—a method of treatment grounded upon these facts might be adopted with benefit.

d. Vegetable Poisons.

253. The effects of vegetable poisons, when considered in conjunction with the general fact, that those of each poison will vary as the idiosyncrasy, pursuits, and habits of life vary, —have a remarkably close general resemblance, and are linked by many points of similarity, with the preceding.

Strychnia excites phenomena very analogous to those of tetanus, hydrophobia, &c. There are the most violent convulsions of the whole system; and when they remit, a slight touch of the surface will immediately re-excite them. This state of spasm and acute automatic sensibility follows poisoning by brucia, and is produced in frogs by opium, although in man this poison acts principally on the hemispherical ganglia. The roots of cicuta, when eaten, excite epilepsy and tetanus;[u] solanum produces convulsive movements, heat of throat, and erections of the penis;[v] henbane epileptic convulsions, and symptoms like those of poisoning by belladonna;[w] belladonna and stramonium excite delirium, laughter, weeping, spectral illusions, somnambulism, jactitation or choreal movements, aphonia, croupy cough, and hydrophobic gasp;[x] the phenomena in fact of some hysteric paroxysms.

e. Excretions retained in the system, and acting as Poisons, but particularly Urea and its compounds, and the materies morbi *of Gout.*

254. The doctrine of the "Humorists," as directly opposed to the views of the "Solidists," will never be re-established; yet it is exceedingly probable, that the vascular pathology which explained every thing on the principles of congestion, inflammation, and organic change of structure, will be considerably modified by the new facts which physiology every day developes, but particularly by those which demonstrate the effects of a depraved circulating fluid upon the nervous system in general. Of these kinds are the phe-

[u] CXII. ii., p. 282; also, XI. ii., p. 574.
[v] CXII. vi., p. 414; and XCIII. xx., p. 205. [w] CXII. iii., p. 571.
[x] Journal Hebdom. 1835; Jour. Univers. xxii., p. 239; and XIV. xv., p. 194.

nomena resulting from the action of poisons, some of which have been briefly noticed.

255. By the bio-chemical changes which are continually going on in vital organisms, new compounds are formed, which, unless excreted by their appropriate organs, will react injuriously, indeed poisonously, upon the system at large. Of this kind are the carbonic acid excreted by the lungs and skin, the compounds of hydrogen and carbon eliminated by the liver, and of nitrogen and carbon thrown off by the kidneys. The consequences of total suppression of these excretions are well known; but the effects of partial suppression have never had a distinct consideration in all their relations, but especially as the result of small doses of poisonous matters circulating with the blood.

The excitement of the brain just before death, which gives rise to coma, somnambulism, spectral illusions, delirium, and occasionally to mental power so vigorous that the opinions of the dying man have, from their correctness, assumed a prophetic character, has been attributed with great justice to the circulation of venous or undepurated blood through the brain. The humoral origin of the coma dependent upon jaundice, and renal ischuria, has been acknowledged by modern pathologists; as also a like origin (under the term "bilious fit") of the nervous symptoms of the hypochrondriacal or melancholic, ascribed by the ancients to the presence of black bile.

256. It is in gout, however, that we have the most distinct and definite series of morbid phenomena, in connexion with alteration of an important secretion—the urinary; a disease, too, which has derived its name from, and embodies in itself all, the leading doctrines of the humoral pathology. As it would be impossible to do justice to this important subject, even by a discursive view, because it must necessarily embrace a consideration of the structure and functions of all mucous membranes in health and disease, I shall limit myself to an inquiry into the relations of the urinary secretion, since it is this which is most altered in hysteria; and that this inquiry may have a more than theoretical utility, I shall make a comparison between gout and hysteria the medium for the detail of facts; so that not only the pathological connexion

of the two diseases may be better illustrated; but also that the nervous symptoms accompanying diseases of the heart, diabetes, and other affections, may be traced to their right cause. Even hepatic diseases are closely connected with renal affections, since in acute hepatitis the secretion of urea is completely arrested, according to Rose and others.

257. The changes in the composition of the urine of hysterical patients will be found detailed in another part of the work, (Part II., chap. ii., sec. ii.,) and this the reader is requested to peruse. It may be stated here generally, that of the many cases related by authors as anomalous hysteric diseases, by far the greater portion were connected with a gouty diathesis, as indicated both by the formation of calculi, by the occurrence of regular paroxysms of gout, and by the descent of the individual from gouty ancestors; they are cases, in fact, which would have been better understood and better treated, if they had been termed anomalous gout; but as the subjects were young females, they were, of course, set down as anomalous hysteria.

258. The gout, independently of these glaring instances, has points of resemblance to hysteria in its general relations, its numerous erratic forms, and its obvious connexion with the renal function.

Gout, like hysteria, is most commonly developed in persons endowed with a hereditary peculiarity of constitution. It rarely, in its common form, attacks women; the exceptions being viragoes, or those who are passed middle age, as stated by Hippocrates and Sydenham; hysteria, on the contrary, rarely attacks men, the exceptions being those who are possessed of strong sexual powers, are continent, and of a gouty diathesis; or, who either by a naturally feminine conformation, or debilitating habits and pursuits, approach the opposite sex. (141.) Gout seldom attacks boys or eunuchs,—hysteria is rarely seen before puberty; hysteria is most frequently seen in lascivious girls; gout is most easily excited into action, in those with hereditary predisposition, by excess in venery, almost all the examples of its occurrence in young men being evidently dependent upon excessive indulgence in this passion. Gout, again, occurs most frequently in spring and

autumn, as has been already demonstrated, (120,) at the exact time when hysteria, insanity, hypochondriasis occur; and when the testes and ovaria of most, if not all, animals are undergoing important changes.

259. These general facts obviously show another analogy between gout and hysteria, namely, the relation of the two diseases to the sexual organs; and if we follow the clue thus afforded, and refer to the organs which erratic gout attacks, and the progress and termination of the singular forms of disease to which it gives rise, we again have some remarkable points of resemblance.

With regard to the surface of the body, I have observed that prurigo, (so often cured by alkalis and colchicum,) and pruriginous eruptions in gouty habits, for the most part attack those parts of the surface covered with hair, and subject to acne. (37, 38.) Prurigo pudendi is a well-known form, occurring in women during pregnancy, or at the cessation of the catamenia. In a case of the latter description under my care, the disease had also affected the upper lip. (37.) In some the axillæ suffer most; in others, the head and forehead. The prurigo senilis of gouty old men, unless very inveterate, is confined principally to the shoulders, chest, throat as far as the ears, and the forehead; the legs are not unfrequently affected.

260. Many disorders of the respiratory organs which simulate asthma, bronchitis, angina pectoris, and other serious diseases, are connected with that state of system in which regular gout is developed; and follow all its general laws. I have cured autumnal attacks of the three kinds mentioned by colchicum and nitrate of potass, in hard-working individuals, who never had suffered from a regular paroxysm, but whose father or grandfather, or uncle or son, manifested decided symptoms of gout. Instances abound in authors, in which not only these diseases, but also paroxysms of hypochondriasis, mania, epilepsy, spasms, paralysis, various neuralgiæ, incessant vomiting, hooping-cough, and cardiac palpitation, alternated with regular fits of gout, so as to leave no doubt of their real nature. Aretæus, Whytt, Stoll, Sauvages, Baillie, Darwin,

Parry, Hosack, Bayle, Copland, Graves,[y] and Holland,[z] are a few of the authors whose observations support this general fact. Dr. Parry, for example, knew a gentleman subject to epilepsy, who never suffered from it after the appearance of gout; a paroxysm of the latter was at last followed by a sudden attack of spasmodic asthma, which proved fatal in twenty minutes. This is one of several similar instances related by this acute observer.[a] Darwin mentions the case of a gentleman who twice, during a fit of the gout, had a most violent cough, like hooping-cough, without fever, and with but a little frothy expectoration. He was never able to sleep more than a few minutes at once.[b] Such coughs are not at all uncommon in young hysteric females, and frequently create great alarm and astonishment.

261. This resemblance of gout to hysteria has not escaped the observation of practitioners, but little benefit to practice has been derived from it. Whytt asserts that hysteria, occurring in women past middle age, is caused by gout; he adds, that he has seen *all* the varied symptoms of hysteria in gouty men, and gives his readers a very curious list of them;[c] Stoll observed globus and clavus hystericus, with difficulty of swallowing, and the more remarkable symptoms of hysteria, in cases of gout;[d] Ferriar also noticed their great similarity;[e] and other writers have alluded to it.[f]

262. Perhaps the most interesting point of resemblance between the two diseases, is the occasional occurrence in both of an erratic secretion of urine, or of some of the urinary constituents. This symptom of hysteric disorder is referred to elsewhere. (Part III., chap. ii., sect. ii. *b*.) According to Dr. Wollaston's analysis, the chalk-like deposits found around the joints of gouty people are composed of uric or lithic acid; by Fourcroy and others they are said to consist of lithate of soda, or ammonia, with some animal matter. Morgagni mentions a case in which these lithates were deposited in the mammæ of a gouty patient; and Dr. Elliotson met with another, in which

[y] XIV. xxiii., p. 188. [z] CI. p. 123. [a] XCIX. pp. 383 and 376.
[b] XLIV. iii., p. 250. [c] XCVIII. pp. 560, 563.
[d] XLIII. Pars v., pp. 437, 443, 499. [e] CII. ii., p. 43.
[f] Conolly, in XV. ii., p. 571.

there were gouty concretions in the ears.[g] I have observed the same. These urinary salts have also been excreted by the skin, salivary glands, intestines, and even by the cellular interstices of muscular and tendinous fibres, as stated by several of the older writers, and very recently by Mr. Mayo.[h] It is worthy remembrance, also, that in most of the cases in which the perspiration or saliva of men have been urinous, the patients have been gouty subjects of renal ischuria.

263. These considerations bring us to an inquiry into the state of the kidneys, and the composition of the urine in gouty people. The connexion between total suppression of the urine and gout, but especially between gout and gravel, has been frequently noticed. It is well known that all articles of diet which, either from their peculiar composition, or their action on the organs of assimilation, increase the quantity of lithic acid, will excite a fit of gout or gravel. The favourable termination of a fit of the gout is always accompanied by an increased excretion of lithic acid from the kidneys. Colchicum also, which is almost a specific for gouty diseases, increases this excretion; the quantity being nearly doubled, according to Professor Chelius, after the medicine has been taken for twelve days. The urine of gouty subjects is in general acid, but during the paroxysm it becomes alkaline, or neutral,[i] and so continues until the termination of the paroxysm, when it becomes loaded with the lithic acid deposit. Cases of gravel, indeed, are simply those in which the acid crystallizes, so soon as excreted by the kidneys; in cases of gout the excretion is suspended; and these lithic acid formations, according to Dr. Prout, seldom occur before the age of forty,—a period of life corresponding to that in which gout is first developed in those with the hereditary predisposition.

264. Facts being such, the direct inference is, that the presence of an excess of lithic acid, or other of the urinary constituents, is the immediate cause of a paroxysm of gout; and that those individuals are of a gouty constitution, who, from hereditary conformation of the organs of assimilation or excretion, either have an unusual quantity of uric acid produced,

[g] VIII. ii., p. 37. [h] XIV. xv., p. 442. [i] XIV. xii., p. 386.

or a deficiency of power in the kidneys to eliminate it from the system, as maintained by Dr. Holland.[j] And such inference is quite in accordance with all toxicological, and (less directly) with many pathological phenomena, apparently unconnected with gout, to some of which reference has already been made. (257, seq.) It is not generally known, that Jahn found crystals of the gouty salts in the blood of gouty patients; a fact, however, of the greatest importance.[k] Turck, a recent French author, attributes gout to the presence either of too much acid, or too much alkali, which latter he connects with a set of acid and alkali-secreting organs, and these with positive and negative electricity.[l]

265. While the preceding statements with regard to the pathology of gout illustrate and confirm the views taken respecting the ovarian origin of hysteric diseases, they open out a large field of inquiry into the relations existing between the ovaria and testes on the one hand, and the kidneys on the other, as well as between both and the two large classes of diseases I have just compared.

According to the researches of Wolff and Rathke, (confirmed by Müller,) the formation of the kidneys in the embryo is preceded by a substance termed by Rathke wolffian bodies, after their discoverer. Like the true kidneys in fishes and batrachian animals, (to which they are analogous in structure,) the wolffian bodies extend along the whole length of the spine, from the heart to the end of the intestine; a fact, as we shall see from the next statement, highly interesting, because it proves the extensive connexion the genito-urinary system has with the spinal cord. In mammalia a vessel proceeds from these bodies, which opens into the vas deferens, or fallopian tube. In the higher vertebrata these false kidneys are used to contribute to the developement of both the true kidneys and the testes and ovaria, the latter first appearing attached to their anterior margin by a fold of peritoneum. In the human embryo, at the seventh week, they are slender elongated bodies, situate below the kidneys, their permanent position in the lower vertebrata.[m]

[j] CI. p. 126. [k] CXXXVII. Supplemt.-Bd. ii., p. 388.
[l] Traité de la Goutte, &c., 8vo. Paris, 1837-8. [m] See CXX. p. 92.

266. Now, this slight sketch of the embryological developement of these organs completes the series of facts, and gives a key to an explanation of many anomalous symptoms and phenomena of both gout and hysteria, and of some diseases connected with them. We can have no difficulty in conceiving how the kidneys may, in many instances, have distinct sympathies, similar to those of the ovaria and testes; or in understanding how the latter may modify the functions of the former, (195,) and so contribute to the establishment of diseases which originate in a defective elimination of the urinary constituents.

267. The connexion of the kidneys with the same structures as are influenced by the ovaria, is illustrated by the sympathy first observed by Whytt,[n] then by Hunter,[o] and afterwards by Underwood,[p] between the teeth and the kidneys and bladder of children; the growth of the former being often accompanied by increased flow of urine, symptoms of gonorrhœa and of stone in the bladder, and by involuntary micturition. Another writer, corroborating these observations, states that he had two patients suffering from disease of the urinary organs, who always experienced a tingling sensation about the throat and ears (74) when they wanted to pass urine.[q] Dr. Parry saw the metastasis to the testicles in mumps, (65,) accompanied by an obstinate suppression of urine, which long required the use of the catheter.[r] Mercury in large quantities will pass off by the kidneys; causing diuresis, without affecting the salivary glands in the least,[s] and discharges will alternate between these organs (Haller, and Par. 65); and to these may be added the general facts observed in gout, previously stated.

The hypothesis that there is some peculiar action of the testes on the kidneys, explains why women, boys, and eunuchs so unfrequently suffer from the gout, and harmonizes the exceptions with the general rule; it enables us to understand, too, how venereal excesses may be the exciting cause of an attack; why the gout recurs more frequently in spring and autumn (120); why, in men, it attacks some organs in preference to others,—as the thoracic rather than the pelvic

[n] XCVIII. p. 597. [o] CIII. p. 234. [p] CIV. p. 252.
[q] XXXIII. p. 31. [r] XCIX. i., p. 384. [s] L. xviii., p. 331.

viscera; why diuretics, and especially colchicum, will induce temporary impotence, as stated by Dr. Beatty and Dr. Copland,[t] and, indeed, the rationale of many other phenomena.[u]

268. The object of the preceding remarks, however much they may appear removed from it, is to show how the notion of a *materies morbi*, being the cause of gout, and that *materies* to be some of the urinary constituents, is both consistent with a large number of phenomena, and has a direct and important bearing upon the pathology of hysteric disorders. In investigating the *modus operandi* of this *materies*, considered as a poison, it must be borne in mind, that it has already an affinity for secreting structures in general; and since irritation of the nervous centres will act as well on the peripheries of secretion as of motion and sensation, (194,) and so excite the phenomena of inflammation and secretion, this *materies morbi*, in circulating through the nervous centres with the blood, may excite changes in the peripheral ends of the secreting nerves, and thus deposits of lithates, or other urinary constituents, may take place in remote organs, from arthritic irritation of the spinal cord. It is not unreasonable to suppose, that the synovial membrane is most usually the part which suffers, from some anatomical relations its nerves bear to those of the kidneys in the spinal cord itself.

This theory of the origin of some gouty and hysteric disorders may be thus more explicitly stated. In an individual of gouty diathesis, an excess of urea or other urinary constituent being produced, and, at the same time, in consequence of impaired action of the kidneys, a diminished amount being eliminated, the excrementitious matter (like digitalis and other poison) accumulates in the system, and at last overcharging it, causes an "explosion" (to use the word of Boerhaave) to take place in the form of a gouty paroxysm; or failing this, excites irritation of different organs in succession, and produces in men the different forms of erratic gout, — in women, of anomalous hysteric disease; the symptoms varying

[t] VIII. ii., p. 32.

[u] Nitre is an old remedy for satyriasis; Voisin quotes an interesting case at length, from Balthasar Timæus, headed—"*Salacitas Nitro curata.*" CXXIV. p. 266.

in each individual, as one or other organ weaker than the rest falls under its noxious influence; so that, in one case, they will be those of mania; in a second, of thoracic disease; in another, of epilepsy; in another, of the hysteric paroxysm; or assume the form of angina pectoris, spasmodic action, or local neuralgiæ.

269. When we consider the composition of this *materies morbi* in its general relations, many useful inferences, both theoretical and practical, may be deduced. Nitrogen is in the largest proportion, and the most important of any of its constituents, and hence the utility of such muscular exercise in gout and hysteria, as will "use up" (if I may be permitted the phrase) the superabundant nitrogen present in the system. Hence also the propriety of a diminished consumption of animal food, and regular exercise, as a prophylactic in both diseases; and hence also the applicability of the same medicinal agents to the cure of both.

Dr. Evans, of Newmarket-on-Fergus, has recently published an interesting case in which there was an enormous secretion of flatus daily from the stomach of a female. The disease had resisted every remedy, and had continued fourteen years. The urine of the patient was deficient in urea, while this substance was present abundantly in the blood; and the flatus was found to contain, on careful analysis, fifty per cent. of nitrogen gas. The father of the patient had suffered from gout, and the patient herself, although at that time in reduced circumstances, had been "nursed in the lap of luxury and ease."[v] This case bears upon the preceding statements in a most interesting manner; and the collection of similar histories and analyses would be the most useful contribution which pathological chemistry could present to practical medicine. The inquiry should be extended to every disease in which flatus is generated, particularly insanity; for it is exceedingly probable that mental alienation, as well as hypochondriasis, is in many instances caused by an arthritic *materies morbi*. I have an instance in my recollection, of a family, the aged father of which, temperate and industrious during his whole life, suffers

[v] CXIII. ii., p. 350.

from rheumatism and gravel; a daughter had herpetic eruptions on the face, which were removed by marriage; a son has been under my care for hypochondriasis, and was cured by ferri sulphas and colchicum; and another is liable to paroxysms of insanity, which are induced by voracious eating, and the imbibition of intoxicating drinks. Whytt's observations on this subject are highly worthy of perusal.[w]

270. It would be leaving my limits if I did more than mention the valuable facts collected by Dr. Bright, which demonstrate so plainly the connexion of cerebral disease with the presence of urea in the blood. Dr. Bright's researches have certainly given an impulse to the study of humoral pathology, or more properly of pathological chemistry, which has already produced excellent results, as evidenced by the works and essays of Christison, Gregory, Osborne, Solon, and Rayer. Amongst these should be mentioned the observations of Dr. Addison, contained in a paper read to the Physical Society of Guy's Hospital, in which Dr. Bright's views are further illustrated, and the connexion between apoplexy, sudden coma, and sudden convulsions is shown.[x] When we consider the intimate relation renal diseases bear to cardiac affections, to the whole class of "liver complaints," and to the numerous forms of disease known as gouty and hysteric, the importance of the study of the urinary secretion becomes most obvious. A theory of disease which referred every symptom to renal derangement, however false, if well carried out, would elicit most interesting facts. During the period in which the scarlet fever was prevalent in York, I treated the cases of paralysis and apoplexy which came under my notice on the hypothesis that the symptoms were consequent on renal affection; and that this last was connected with the prevailing epidemic. The results I published in the Dublin Medical Press, for July 1st, 1840, to which I refer the reader.

[w] XCVIII. p. 556. [x] XIV. xxiii., p. 651.

CHAPTER VI.

RELATIONS OF THE EMOTIONS, PASSIONS, AND PROPENSITIES.

SECTION I.

THE EMOTIONS AND PASSIONS.

a. General Remarks.

271. The action of the nervous system on itself in exciting and modifying hysteric disease, would alone be a subject for a volume. Some of the modes in which this occurs, and its effects, have been already noticed in my remarks on the relations of nervous disease to the active periods of a woman's life. The agency of local nervous disease in exciting epilepsy and general convulsions will be considered in a succeeding part; so that nothing remains but an inquiry into the relations which the passions and propensities in general, and the will, bear to nervous diseases. The agency of voluntary and involuntary attention upon the sensorial system, or, in other words, the effects of *sensorial will* have already been noticed; and those of *motor will* do not require special remarks; so that the present chapter will be best devoted to the passions and propensities, so far as they are connected with our subject.

272. The part of the cerebrum which may be considered as the seat of the passions has been already hypothetically indicated, its anatomical relations described, and the general physiological laws by which its functions are regulated have been demonstrated. (182.) From the anatomical relations thus shown, and a cursory glance at the effects of the passions on the system at large, particularly of joy, grief, fear, we should readily infer that they were confined to the organs and parts

supplied with nerves from the respiratory ganglia. But, on extending our inquiry, it is equally evident that the relations of the passions are as extensive as those of the respiratory system, as regards the viscera (200); and further, that they implicate organs in connexion with the dorso-lumbar portion of the cord. This fact may be observed generally in lower animals, which express emotions by the caudal extremity, as well as by the eyes, ears, lips, and neck. The horizontal and vertical movements of the tails of the feline and canine races express opposite emotions. The lion, or cat, lashes his tail from anger, the dog wags it from delight; the erected tail of the cat expresses fear; of the dog, confidence and courage. Yet the cervical as well as dorso-lumbar region is affected. The dog erects his mane when ready to fight, while the hair on the tail of the cat is similarly affected when on the defensive. Grinning in the dog denotes rage; in the horse, amiability and pleasure. These illustrations might be multiplied to a great extent, by a detail of the habits, not only of mammalia, but of birds, fishes, reptiles, and insects; for in all these animals, the anatomical relations of the organs affected by passions and emotions to the central nervous system are the same.

b. The Depressing Passions,—Grief, Fear, and their Modifications.

273. By far the greater number of violent and unmanageable symptoms in hysteria have been excited by grief and fear, and their modifications, as terror, despair, &c.; the effects, however, vary according to their intensity, the circumstances of the individual, and the causes which excite them. Montaigne gives some curious instances in his essays in which fear was the cause of impotence. Analogous is the paralysis of the bladder, which many experience when they attempt to pass urine in the presence of others; mental excitement will occasionally excite spasmodic stricture of the urethra; and surprise or anxiety will check uterine action, as most accoucheurs must have noticed during their juvenile practice. Children, from very slight emotions of fear, will have diarrhœa, involuntary micturition, and involuntary movements.

274. The immediate effects of extreme fear or terror on women may be thus stated:—first, chorea, convulsions, hysteric paroxysms, syncope, coma, catalepsy.—Second, constriction of the scalp, (which is spasm of the occipito-frontalis,) paleness of the face and spasm of the facial muscles, spasm of the glottis, aphonia, gasping, palpitation.—Third, menorrhagia or suppressed menses, diarrhœa, increased flow of urine, and frequent desire to pass it; relaxation of the sphincters, loss of power over the legs.—Fourth, profuse sweats, increased or diminished secretion of colouring matter from the skin, (Alibert, Rostan,) suppressed secretion of milk. Some of these are more immediate than others, at least in appearance; thus paleness of the face appears instantly; diarrhœa only after the lapse of some minutes. Many of them disappear so soon as the terror terminates; but the greater part become permanent in nervous delicate females, and are accompanied by spinal tenderness, paralysis, shifting inflammatory affections, hæmoptöe or hæmatemesis; in short, the case becomes an aggravated form of spinal irritation, and the patient may drag on a miserable diseased existence for months and years.

275. In the effects of grief, whether immediate or secondary, we have the same general phenomena, some being more, others less obvious. In general, the convulsive movements of the face and respiratory muscles are more obvious, and there is hysteric globus, sobbing, and lachrymation. The respiration is slow and oppressed, the action of the heart impeded, and there is a peculiarly painful sensation at the epigastrium. Dr. Crichton states that the last-mentioned symptom is almost peculiar to females, (this I doubt,) and that he has seen two instances in which it was accompanied by hæmorrhages from the stomach, lungs, and uterus.[y] The sensation is often felt by men who are suffering under the pressure of misfortune, and it is that which they vainly attempt to "drown in the bowl." It is literally the parent of sighs, and is the invariable accompaniment of the broken heart. Hæmorrhages certainly accompany grief. An instance of this kind occurred to me in the case of a delicate female,

[y] CXIV. ii., p. 190.

who, on the occasion of her child being seized with convulsions, suddenly began to spit blood: it was frothy and florid. Any disease, too, of the nervous system, to which the patient is subject may be excited by grief: it was thus M^de. Malibran was thrown into a fit of catalepsy.[z]

276. The causes of grief are rarely so sudden in their action as those of terror; the shock is therefore less violent; but they are more permanent, and so the symptoms they induce go on increasing in intensity, until the intestines ulcerate, the body wastes, the mind is debilitated, and the temper displays every variety of mood from hysteric capriciousness to absolute insanity. In an entry in his journal soon after the death of Lady Scott, Sir Walter remarks, "I do not know what other folks feel, but with me the hysteric passion, that impels tears, is a terrible violence—a sort of throttling sensation—then succeeded by a state of dreaming stupidity, in which I ask if my poor Charlotte can actually be dead." After what has been stated respecting the anatomical and physiological relations of the passions, we can feel no surprise at finding that immoderate laughter is not only a sign of extreme grief, but will follow attempts at mimicking the passion. Of the last-mentioned kind is the well-known circumstance, termed by Dr. Crichton unaccountable, "that many people, when they have to tell us of the death of another person, feel themselves often inclined to laugh at the moment they begin to speak of it; and these individuals are possessed of fine feelings."[a] Actually poignant grief will induce a propensity to immoderate and uncontrollable fits of laughing at anything or nothing, as I have myself observed. Religious enthusiasts, especially women, have been attacked by this form of hysterics; and I have elsewhere related some curious illustrations of the fact[b] which I quoted from Wesley's Journal.[c] The paroxysms came on during their religious services, and the laughter was accompanied by convulsions, and such oaths and blasphemy, that the affection was attributed to the "buffettings of Satan." But in fact we have precisely analogous phenomena in cases of insanity, in which

[z] XIV. xix., p. 111. [a] CXIV. ii., p. 155.
[b] VII. xlix., p. 451. [c] In Works, 8vo., London, 1809, ii., pp. 35, 36.

modesty is changed into obscenity, devotional habits into scornful contempt for religious things, and the feelings in general are perverted. Indeed young ladies in a hysteric paroxysm will sometimes utter expressions which one would think it impossible they could know. Amongst the effects of grief, too, must be mentioned the gaiety displayed by individuals about to die on the scaffold, for such is the "lightning before death" mentioned by Shakespeare; that oft quoted phrase having no reference to that of the people who die quietly at home in their beds.

> "How oft when men are at the point of death
> Have they been merry? which their keepers call
> A lightning before death."
>
> ROMEO AND JULIET, Act. v., Sc. iii.

Grief is the most common and most injurious passion of humanity, with the exception of its sister emotion anxiety. A thousand circumstances are continually happening to excite it. The domestic hearth, and the public walks of life, are alike exposed to its inroads. Religion, love, politics, trade, all minister to it, but especially love in the young female. Many suffering from erotic disappointments sit "smiling at grief," a prey to wasting nervous disease; and hence the importance of an inquiry into the feelings and connexions of the young female patient.

c. The Erotic Passion.

277. Little remark is necessary upon this part of the subject, as the influence of the reproductive impulse has been already traced throughout its various ramifications. The action of the erotic feeling upon the nervous system and its capability of exciting hysteria, is evident from many facts. Erotic grief is well known to the hysterical, and "Salacitas major, major ad hysteriam proclivitas," is almost a medical proverb. Hence the remarks and *methodus medendi* of Hippocrates already quoted. (207.)

It is doubtful, in most cases, whether the exaggerated erotic passion, characteristic of nymphomania, be a cause or an effect of the accompanying symptoms. This disease has

not been minutely observed, but L. Villermay[d] quotes cases from Helvetius and Chambon, which were accompanied by the phenomena of hysteria in the highest degree; and enumerates an appearance of strangulation, great horror of liquids, and the excitation of pain and general spasms by the slightest touch, as prominent symptoms.[e] In a case he records, there was distended hypogastrium, spasmodic constriction of the œsophagus, sardonic grin, hiccup, and irregularity of pulse. He also details a case observed by Alibert in the Hospital St. Louis, in which the slightest touch excited frightful convulsions, and these would continue for half an hour, the patient uttering lamentable cries, and exactly resembling a "convulsionnaire of St. Médard." In this case the hips, thighs, and legs were surprisingly plump, while the chest and upper extremities were in a state of complete emaciation. In another case, (quoted from Steggmann,) of a young girl twelve years old, sardonic laugh, and extraordinary convulsive movements were accompanied by such an erection of the nipples, as to raise the shift. In some cases of aggravated hysteria there is a slighter degree of nymphomania, but the display of it is usually confined to lascivious glances only, although two cases have been mentioned to me, in which the medical attendant was solicited, and I have heard of others. This depraved feeling leads the patient not unfrequently to feign retention of urine, that catheterism may be performed.

278. The symptoms of satyriasis resemble those of nymphomania. Duprest Rony quotes a case[f] in which there was painful sensibility of all the organs of sense, analogous to that of phrenitis or hydrophobia. Crichton relates another of erotomania, bordering on satyriasis, which terminated fatally on the fifth or sixth day, with all the symptoms of hydrophobia.[g] And it is not improbable that when the phenomena of the hysteric paroxysm occur in strong men who are continent, they originate in the same way as hysteria and nymphomania in the robust and chaste female. Of this

[d] XLII. xxxvi., p. 566.
[e] Op. cit., pp. 570, 571.
[f] XLII. i., p. 51.
[g] CXIV. ii., p. 322.

kind, probably, were the cases mentioned by Dr. Trotter and Dr. Watson.[h]

d. Jealousy, Rage.

279. The hysterical are peculiarly subject to jealous fears and hatreds, and these originate sometimes from the peculiarities of the sexual system, as erotomania, but, in other cases, excite them. It would appear that intense jealousy has an immediate action on the reproductive organs, from the following history of Cabanis: "J'ai connu un jeune étudiant en médécine qui, dans un violent accès de jalousie, éprouva pendant plusieurs heures le priapisme le plus invincible et le plus douloureux, accompagné tour à tour de pertes de semence et d'émissions d'un sang presque pur."[i]

280. The secondary effects of jealousy are like those of other violent passions; affecting the health in general through the chylopoietic viscera. It is singular that brutes will die of jealousy. Sir T. S. Raffles remarks "with regard to the Ungkaputi, (*simia lar*,) it is the general belief of the people of Sumatra that it will die of vexation if it see the preference given to another; in corroboration of which I may add, that the one in my possession sickened in this situation."[k] The same remark is made respecting the parrot.

281. There is a class of hysterical females, endowed with strong feelings generally, in whom the more violent passions, as rage and jealousy, are easily excited. The most common effect of anger in the nervous woman is a hysterical paroxysm, which presents different modifications in different individuals, being in some convulsive, in others comatose, &c. When once a female has indulged in petty sallies of temper with this result, each succeeding paroxysm is more readily excited and returns at shorter intervals, until the wretched woman is a nuisance to herself and every one about her.

The effect of violent rage is most exhibited in the vascular system; the heart beats violently, the temples throb, and the face is alternately pale and crimson. The under lip is spasmodically drawn down, there are twitchings of the scalp and

[h] VII. xi., p. 303. [i] LIII. ii., p. 402.
[k] XXXII. xiii., p. 243.

extremities, and sometimes the head is jerked rapidly up and down; syncope, or fainting, or convulsions may be induced, and the whole ends in a flood of tears, a headache, and a quiet stillness. If, however, there be liability to disease in any part of the nervous system, this will be affected, the symptoms of irritation of that part will be developed, and chorea, neuralgia, &c., follow.

SECTION II.

THE PROPENSITIES:—THE PROPENSITY TO IMITATE.

282. The propensity to imitate has been considered as a simple faculty of the mind, but it is in reality a very complex operation, accordingly as circumstances vary. In most instances there must first be a susceptibility of excitement developed, and this may be either local or general. All local, spasmodic, or rhythmical movements, are also more readily excited in proportion to their frequency; or, in other words, the susceptibility is increased by repetition.

What are called imitative movements are not necessarily the result of witnessing the like in another person. As in this case the cause acts by exciting an idea in the mind, the same idea may be re-excited by an act of memory, or by its being brought before the mind in some chain of thought. Thus, persons much in the habit of yawning will yawn by merely hearing the word, or by seeing it in print as they see it now. But the idea and movements are more readily excited by witnessing their original; so that when individuals are congregated together, if one yawns, his neighbour very unconsciously yawns also; if another wags his leg, half a dozen legs across will instantly commence wagging. This fact may be easily observed in public assemblies: of fifteen men I observed seated on a bench at a public sale, the legs of no fewer than six were in full swing. M. Chevreul wished to know whether he had been truly informed that a pendulum formed of a heavy body and flexible cord

oscillated when held over a certain body, although the hand were not moved. In a letter to M. Ampère, he states that when his eye followed the oscillating pendulum, he felt a sensation of a tendency to motion, which was satisfied in proportion as the pendulum described a greater arc. When his eyes were bandaged, the oscillations were very feeble.[1] This is an exceedingly interesting experiment, as directly illustrating the preceding remarks. These imitated movements belong in fact to the excito-motory class, and are analogous to those of the " true spinal system," being equally involuntary, often equally independent of consciousness, and differing only in this, that they are excited by impressions made on the cerebral nerves, and compounded into ideas, instead of by impressions made on the tactile apparatus of the surface. It would appear that the consequences of that process here termed imitation (but I think improperly) are not confined to the motor system; for it is a remarkable fact that two or three of the attendants, both in the Retreat and the York Lunatic Asylum, have become insane. These isolated instances cannot be admitted as proof, but the circumstance is worthy of investigation; because, if the supposition be correct, the assembling of lunatics together must in itself prevent their recovery, or augment the mental aberration.

283. The movements induced or accompanied by emotions have the highest degree of complexity; but the proneness to be affected with the former is in a direct ratio to the susceptibility of being excited by the latter; hence females and children are more liable than men, indeed are alone liable, to epidemic or endemic convulsions. The mind, however, may be so excited by oratory, or by religious exercises, that a temporary susceptibility is developed. The orator who weeps or laments with the purpose of infecting his hearers, first prepares them by appealing to their feelings or passions. By a stranger who came in unprepared to be moved to tears, the orator would be considered rather an object for ridicule than imitation. The infectious mirth of the social is very analogous; let an individual suddenly join a laughing party,

[1] XXXV. iv., p. 141.

—he will be disposed to be rather morose than gay, and will perhaps surlily remark, that they are amused at little cost of wit.

284. It is in the convulsions of popular assemblies thus excited, that we have an illustration of the effects of fearful attention, (188,) and the type of those extraordinary epidemic and endemic choreas and odd muscular movements, which have from time to time caused so much wonder. The most remarkable of these epidemics is that which occurred in 1374, and followed the "black death." It found men's minds excited by the dreadful scenes they had witnessed, and by the ardent religious exercises they performed, with the hope of escaping the desolating plague. In Aix la Chapelle, at that time the focus of German superstition, the people "formed circles hand in hand, and, appearing to have lost all control over their senses, continued dancing for hours together in wild delirium, regardless of the by-standers, until at length they fell to the ground in a state of exhaustion. They then complained of extreme oppression, and groaned as if in the agonies of death until they were swathed, or clothes bound tightly about their waists, on which they recovered."[m] They were swathed to relieve the tympanites from which they suffered. When the disease was completely developed, the attack commenced with epileptic convulsions. According to Mezeray, as quoted by Sauvages,[n] in Holland it was called St. John's dance, and the people crowned with flowers, and naked, went dancing and singing through the streets and churches.

The term St. Vitus's dance was derived from an endemic affection of this kind which prevailed near Ulm, and was witnessed by Horstius. Many women used to assemble every May, at a chapel near that city, dedicated to St. Vitus, (St. Veit, Guy, Guido,) on the feast-day of the saint, and dance night and day in ecstacy, and in a sort of delirious insanity. Sauvages mentions a similar endemic chorea as taking place in the Cevennes. Young women, with their lovers, repaired on the feast-day of the Virgin to a chapel dedicated to her, and

[m] CXV. p. 5. [n] XI. ii., p. 257.

there, far from their parents and guardians, danced to fiddles, and indulged their inclinations, as if delirious; many under the cloak of religion so ardently desired these amusements, that if prevented they became ill: "I speak knowingly," says Sauvages, "for I was present at these feasts." Another instance of endemic chorea is quoted from St.-Gervais. It appears that this traveller witnessed near Tunis an epidemic or spontaneous tarantism which was termed *le Janon*. The individuals affected leaped and danced involuntarily, and were for the most part of the female sex.[o]

Many similar instances might be mentioned. In Lanarkshire, in 1742, convulsions resembling the preceding, that is, accompanied by religious mania, spread epidemically; and the same occurred more recently in Tenessee and Kentucky. Sometimes little or no religious feeling was complicated with the epidemic; as in Zetland, in 1774; in Angus-shire, under the name of the leaping ague; and in Wales, in 1796, as described by Dr. Haygarth. Wherever, in fact, a number of females or children assemble together, and two or three become affected by convulsions, it is exceedingly probable many others will be affected also; and hence the numerous histories in which they are described as attacking the female and juvenile inmates of factories, schools, congregations, hospitals, and families.

SECTION III.

CAUSES WHICH MODIFY THE INFLUENCE OF THE PASSIONS ON WOMAN.

285. It is unnecessary to do more than allude to other propensities, as the infanticidal, and that which impels to deceive. But it should be observed, that all mental alteratives act more powerfully on woman at the menstrual period, and during or just after delivery, than at other times; and, when connected with maternal cares and duties, more especially on the organs in connexion with the ovaria. A lady

[o] XI. ii., pp. 231, 232.

of my acquaintance, feeling solicitude for the welfare of her son, had temporary diabetes to a great extent, and was obliged to rise frequently in the night; with the exception of slight anorexia, and a propensity to weep, this was the only obvious symptom. Sometimes the colon is affected, and there is increased excretion of flatus, and slight spasmodic action of the gut; the bowels then "yearn." Another lady of my acquaintance, in good health, was informed that her little boy had been leaning out of a chamber-window in a very dangerous position. She immediately felt sudden faintness and pain in the occiput, and soon after violent spasmodic colic, and great tenderness of the abdomen.

286. There is another point in the history of mental emotions which should ever be remembered, namely, the power they possess of curing certain diseases of the nervous system. This fact is so notorious as to require no comment: the patient who has been confined to her couch for months, a helpless paralytic, will literally rise up and walk at the bidding of any individual who can strongly influence her mind; and not unfrequently the acquisition of a lover, and the prospect of marriage, will work an equally wonderful cure. In cases of this kind, it would be altogether erroneous to assert the previous disease was feigned; and this same principle must be carried out into the minor mental emotions, as when some nervous symptom,—cough or spasm,—habitually recurring, is checked by threats, or excited at certain periods, as at the visit of the medical attendant. Fear will restore the maniac to reason;[p] cure violent sea-sickness, or prevent it;[q] excite the secretion of urine after it has been long suppressed; cure paralysis in an infant;[r] and arrest the most frightful imitative convulsions. Ague is well known by the sufferer to be a real disease, yet very often has ague been cured by fear, or disgust, or hope. The Hungarians plunge people under water to cure ague; and Stoll says this practice originated from the fact, that a priest was cured by being driven into a river by his drunken coachman, and compelled to leap out of

[p] XCIII. xxvii., p. 540. [q] Darwin, XLIV. i., p. 333.
[r] CXXXVII. Bd. xxi., p. 322.

the coach into the water.[s] Stoll relates another case in which the patient was so much amused by an individual at his table, that when the hour for the paroxysm came, he quite forgot it and escaped it.[t] It is plain from these facts, that we must not hastily conclude that a patient has been "malingering" under the circumstances mentioned; at the same time remembering that the extraordinary symptoms of hysteria are often complicated with monomaniacal deception; the facility with which they can be brought on, and the wonder they excite, contributing to induce a half-real, half-feigned disease, often of a very injurious character. In such instances the most frightful convulsions,—epileptic, tetanic, and hysteric,—as well as delirium, somnambulism, and coma, are so often excited voluntarily that they become habitual, are developed involuntarily, and are at last followed by permanent injury to the health, and even by death. It is in these cases that mental emotions act most readily, and hence the necessity of the most cautious and guarded inquiry and expression of opinion, when they are concerned.

[s] XLIII. Pars iv., p. 435. [t] Ibid., p. 446.

CHAPTER VII.

RELATIONS OF THE NERVOUS DISEASES OF WOMEN TO THE NERVOUS SYSTEM IN GENERAL.

287. At the close of paragraph 190, I stated this general law, namely, that gradual impairment of the functions of the nervous system is preceded by exalted energy and affectibility; hence the difficulty of distinguishing altered secretion, delirium, asthenic spasm,—and neuralgia just about to end in coma, paralysis, and anæsthesia,—from inflammatory diseases of the spinal cord.

Referring, with this law in recollection, to the statements in Part I., respecting the influence and anatomical and physiological connexions of the ovaria, we can have no difficulty in understanding how these organs, by acting upon the dorso-lumbar portion of the cord and the respiratory ganglia, may give rise to the most varied symptoms of disease in distant and different organs, varying in intensity from the most to the least severe, and implicating the sensitive motor, and organic nerves.

SECTION I.

THE RELATIONS OF SOME GENERAL PAROXYSMAL AFFECTIONS TO THE CEREBELLUM AND CONTIGUOUS GANGLIA.

288. The special pathology of these symptoms will be noticed under their proper heads; but there is a numerous class of symptoms which will be best noticed here, and the localization of which requires a reference to general principles: I refer to

general convulsions of every character, and choreal movements of every kind, whether in the form of leaping ague, or in that of malleatio, alternate supination and rotation, &c.

All these convulsive affections pass into one another. The hysteric paroxysm is a species of epilepsy, and in some of its forms is known from the latter only by globus, weeping, and pale urine. Epilepsy is the disease of boys, as chorea is of girls, and is frequently accompanied by the rarer forms of chorea, such as the propensity to run forwards or backwards, revolve, leap, dance, &c.

289. To the previous remarks on common chorea, or subsultus, (216,) I would add the following respecting the true or rhythmical chorea; and the generic resemblance of the two diseases will be at once manifest.

Of seven cases, the details of which I have carefully examined, five were females under the age of puberty; in one, the patient was a highly hysterical female, aged forty-two, subject to epileptic fits, and the choreal movements were not strictly combined;[u] in the remaining case, the patient (a female) was twenty-three years old, and had been indisposed with a variety of complaints, for the preceding seven years, so that puberty in this case was the period at which the disease primarily commenced.[v] The leaping ague of Angus-shire was most frequently seen in impubescent girls, and was accompanied by tremors, cephalæa, epilepsy, coma, aphonia, hiccup, ejulation, as in the paroxysms of the seven cases mentioned. In some, consciousness was abolished; constipation was observed in all except one; paroxysms were in general excited easily by slight agitation of mind; and the individuals were exceedingly susceptible of every kind of impression: in one, during the paroxysm, the very idea of being touched caused a sensation of horror; forcible arrest of the convulsive movements would cause the fiercest rage. In Mr. Crichton's case the attack was connected with a fright, from the entrance of thieves into the house, and the young lady invariably concealed her trinkets during the paroxysm.

290. With regard to the particular set of movements, no one

[u] CXVI. iv., p. 326. [v] VII. xxxiii., p. 261.

seems peculiar to a special state of disease. In some, they consist of a regular and rapid flexion and extension, and pronation and supination, so that the parts of the nervous system are in some way connected with special muscular antagonism; in Dr. Watt's case, vertical and lateral rotation, and inverted perpendicularity, were observed in succession;—an apparently inverted sense of relation to the plane of the horizon preceding the latter. In the Angus-shire ague, if the progressive movements were prevented, the patients would leap upwards, and rotate round the rafters of the house, with a motion resembling that of the fly of a jack. Retrograde movements were not observed in any of the cases; these indeed are rare. Three are mentioned in Casper's Wöchenschrift,[w] another in Schmidt's Jahrbücher,[x] and another was observed by Raciborski, in a hysterical girl.[y] Magendie mentions a case of the same kind which was shown to him at the Royal Academy of Medicine, by Dr. Laurent; the patient was a hysterical female.[z] Madame Malibran, according to Mr. Belinaye,[a] was subject to fits of insensibility and catalepsy; waking from one of these, she unconsciously precipitated herself down a flight of stone stairs. When taken up, she remained inanimate and motionless for some time, and then began to roll over and over from right to left. After the application of a few leeches she recovered. An Italian professor has described a case of epilepsy as something quite new, and proposed a new name, namely, epilepsia dromica et trochaica.[b] It occurred in a young man subject to epilepsy, whose fits for seven years began with a loud cry, and an irresistible propensity to run forwards in a straight line; he would climb stairs with extraordinary rapidity (*epilepsia dromica*). At the end of seven years, the character of the fits changed. He now fell down senseless, screamed out, and then rolled over and over. (*e. trochaica.*) A very similar case occurred to myself. (236.)

291. Great facility in balancing the body, or in climbing,—

[w] For 1833, p. 1066. [x] CXXXVII. Bd. xviii., p. 163.

[y] Précis pratique et raisonné de Diagnostic, &c., 8vo. Paris, 1837, p. 397.

[z] CXVII. p. 191. [a] XIV. xix., p. 112.

[b] Sopra due malattie non ancora descritte; Mem. del Dott. S. Semmola, Prof. di Scienze Mediche, &c. Napoli, 1834.

as leaping upon and sitting on the top of a door, or running round the edge of a table,—have been observed in cases of somnambulism, as well as in those on which I have just remarked.[c] Something analogous is the impulse to place the centre of each foot, when walking, precisely on the line of junction of each flag, on the flagged way, or of each brick or board on floors, experienced by some individuals. They may be easily known in the streets by the position of their head, and by their unequal strides. Sometimes, in cases of chorea, there is a propensity to dart the finger at a given point, or into a hole,—a piece of legerdemain often performed with great dexterity.

292. If we trace out the analogical relations of these diseases, their singularity is in some degree diminished. Dr. Elliotson remarks that vertigo frequently attends them, whatever be their variety, and very justly adds that vertigo cannot be their cause. It, however, is a sensation originating in the same parts as the rotatory movements. Let an individual revolve from twelve to twenty times on as small a circle as possible, and he will find, on ceasing, that, conjoined with the vertigo excited, there is a propensity to rotate, by which he will be irresistibly compelled to perform one, two, or three additional revolutions; so that the temporary state of the encephalon, under these circumstances, probably resembles that of the rotatory paroxysm. Waltzing, in a small room, has a similar effect.

293. The inverted perpendicularity is analogous to a sensation perceived after sleep, as if the feet were placed where the head ought to be, and which is sometimes followed by attempts to rectify the supposed improper position; it is almost peculiar to children on waking. I have occasionally experienced it with some vertigo, and nothing less than complete consciousness removed the erroneous impression. Stoll experienced sensations analogous to these. During an attack of malignant fever, he suffered from delirium, &c., and when convalescent, among other symptoms, "objecta omnia ad perpendiculum erecta, ita inclinata pronaque adparebant quasi in

[c] Elliotson, LXXXVI. p. 643, seq.

meum caput ruitura. Quæve cum horizonte παραλληλως excurrebant mihi videbantur elevari atque ita assurgere, ut, qui per cubiculum ambulabant, per planum acclive ascendere viderentur, mihique ipse visus sum plano pavimento incedens per acclivia gradiri."[d]

Some of the other extraordinary movements before mentioned were probably connected with a sensation of the body being lighter than usual, depending partly on anæsthesia, partly on a sense of much-diminished muscular effort. After unusual mental labour, I have felt on lying down as if I were floating buoyantly down a stream. The like sensations are induced by camphor. John Hunter, after much mental anxiety, experienced a feeling of being suspended in air, of his body being much diminished in size, and of every motion of the head and limbs, however slight, being both very extensive and accomplished with great rapidity;[e] all which may be excited by poisons, as the datura, *amanita muscaria*, &c. Now I conceive, that if the sensations had been a little more intense, combined and rapid involuntary movements would have followed. It is well known that sheep have a disease of this kind; but it is a somewhat curious fact that ants and bees suffer from vertigo. Huber shut up a virgin female ant, and she began to rotate, making about a thousand turns in an hour, and so continued for seven days.[f]

294. Now all these movements may be connected with a measure of time, or more frequently with a popular or favourite tune, as in tarantism: the consideration of this class of movements leads us a step higher in a continuous chain of phenomena.

We have traced infantile convulsions to common choreal jactitation, (216,) the latter into the combined movements just investigated; and these, it may now be observed, are generally connected with rhythmical chorea, or with combined movements repeated mechanically at regular intervals of time. Thus in a case related by Mr. Kinder Wood,[g] choreal movements of the eyelids, flexion and extension, pronation and supination of the extremities, malleation, propensity to leaping upwards, and, lastly, true rhythmical chorea, to the air of " The Protestant

[d] XLIII. ii., p. 16.
[e] CXVIII. i., p. 62.
[f] LXV. *French edition*, 1810, p. 201.
[g] XLV. vii., p. 238.

Boys," appeared in succession. In other cases of hysteric affection this symptom has been prominent, accompanied with many others of tarantism (251); the whole series of movements connecting the excito-motory phenomena with *ideagenous* changes in the ganglia of consciousness.

295. In the nervous affections of the class just described, what portion of the encephalon is implicated? I think the answer is, the cerebellum and adjacent parts; for it will be at once seen that these morbid phenomena have an intimate relation to the theory, which has been more or less advocated and acknowledged by Hertwig, Flourens, Bouillaud, Rolando, Foville, &c., that the cerebellum is the seat of combined movements.

Flourens gradually sliced away the cerebellum. During the removal of the first slices, only a little weakness and want of harmony in the movements occurred. As the experiment proceeded, disorderly and abrupt movements were excited; and the faculties of flying, walking, standing up, &c., were gradually lost; and when the entire cerebellum was removed, the animal was totally unable to perform regulated movements. Bouillaud makes the important remark, that the phenomena differ accordingly as the cerebellum is irritated or destroyed; if the cerebellum be only irritated, he says, its functions are not abolished, but thrown into confusion; and there are jumping, falling heels over head, whirling, and all the puzzling movements observed in leaping ague and its modifications the rarer forms of chorea, and which are executed with such rapidity that the eye cannot follow them; sometimes the motions are like those of epilepsy. Magendie found that animals, when wounded in the cerebellum, made an effort to advance, but were immediately compelled to retrograde. Flourens experimented also on the tubercula quadrigemina, and found that rigors (a constant attendant on convulsive paroxysms, especially the hysterical) and convulsions followed irritation of these structures; extirpation of one caused blindness of that side, and involuntary motion,—an observation confirmed by Hertwig and Bouillaud.

296. Magendie is much more remarkable for the number and variety of his experiments, than for the accuracy and com-

prehensiveness of his inferences; and I think it is one of his errors, to infer that certain parts of the brain subserve to movements in definite directions. His experiments are much more in favour of Bellingeri's views of muscular antagonism, which explain a distinct class of pathological phenomena, implicating the flexors and extensors, and their analogues, the adductors and abductors, the pronators and supinators. Thus the results of a section of one *crus cerebelli* are more favourable to the doctrines of Bellingeri than of Magendie; for this section cuts off the communication of the cerebellum with one half of the body, and so paralyzes that half; the opposite side consequently is not antagonized, and an instinctive muscular effort is concentrated upon the muscles of that side, and throws them into violent action. It must also be remembered, that the motor fibrils, along which the will acts, are still uninjured; and this will modify the results very extensively. It is perhaps from loss of control over the muscles that we have the motion forwards on section of the corpora striata, for our will acts as frequently to resist the instinctive movements as to assist them; indeed, it is upon this principle that moral responsibility is founded. Reflex movements, also, are more readily excited in proportion as the mass of nervous matter is diminished, to which the peripheral changes are propagated; for when the spinal cord is divided in the loins, reflex movements are much more readily excited in the lower extremities, than in the upper, still in connexion with the cerebral mass: now, something similar may occur in separation of the spinal cord from the cerebellum, or of the cerebellum from the hemispherical ganglia.

297. Pathological anatomy confirms the deductions of experimental physiology. Dr. Toulmouche, in a paper published in the Memoirs of the Royal Academy of Medicine, gives many instances of horses having a total inability to move forwards, or an uncontrollable propensity to move on; these symptoms were connected with inflammation of the arachnoid covering the cerebellum, medulla oblongata, and tuber annulare. He mentions similar instances in the human subject, and adopts a modification of Magendie's doctrines. Andral relates a case of cancer of the cerebellum, in which there was a momentary

retroflexion of the head and trunk.[h] A man affected with rapid rotation of the head and paralysis, died in the Hotel Dieu. He had a small tumour on the tuber annulare, which adhered to the cerebellum.[i] A child had a curious movement of the head, alternately right and left, and *vice versâ*; —a cyst was found in the right lobe of the cerebellum, which contained numerous calculi.[k] An individual was unable to walk; there were frequent convulsions; and deglutition, respiration, articulation, and intelligence were all imperfect;— the corpora olivaria and mammillaria and the crus cerebelli were in a state of cartilaginous hardness.[l]

The pathology of chorea and epilepsy do not throw much light on the question; but what is known is in accordance with the preceding statements. Greding remarks, that of twenty epileptic patients whose bodies he examined, there was not one in whom the cerebellum was not much smaller and softer than usual.[m] Pain in the occiput is a very common symptom in chorea and hysteria: in a little girl affected with the former, who came under my notice while attached to the York County Hospital, the cerebellum appeared so much enlarged, as to have given its exact form posteriorly to the occiput, so that the finger could easily define its lobes and extent. Serres stated to the Royal Academy of Medicine that in four cases of chorea, he found the tubercula quadrigemina altered. A child aged three years had a peculiar unsteadiness in walking, and want of control over its arms in attempting to lay hold of any thing;—in the posterior part of each lobe of the cerebellum, there were two tubercles of the size of walnuts, and the whole of the organ was extensively softened.[n] A female, aged thirty-five years, had cephalæa, tremulous walk, and hysterical symptoms;—a tumour was found at the base of the cerebellum, springing from both lobes, and descending into the spinal canal as far as the sixth nerve.[o]

298. A diligent search would, I have no doubt, accumulate

[h] Lectures in XXX. ii., 1836, p. 102.
[i] XIV. xv., p. 143.
[k] Andral. Clin. Med. v., p. 720.
[l] CXIX. App. Case xviii.
[m] CXIV. ii., p. 425, App.
[n] CXIX. p. 78.
[o] Op. cit. App. Case i.

a mass of evidence in favour of the views respecting the seat of epilepsy and chorea in all its forms, as well as of the hysteric paroxysm; but the preceding may suffice. It is worthy of notice, however, that the large class of phenomena dependent upon poisonous matters circulating with the blood, have a distinct relation to the pathology, as well as symptomatology of these diseases. M. Flourens has shown by experiments that belladonna acts on the corpora quadrigemina, and nux vomica, alcohol, the ethers, camphor, &c., on the cerebellum; each substance leaving marks after death which distinguish the affected organ.[p] He confines the action of henbane, lactuca, and opium to the cerebral lobes, but it is certain that opium acts on the whole nervous system, since in frogs it developes a general tetanic sensibility resembling that excited by strychnia. In a case of poisoning by nux vomica, related by Orfila and Ollivier, there was found much serous effusion over the cerebellum, and its structure was softened. When we compare the symptoms of tarantism, and those of poisonous bites in general, with the preceding, we can come to no other conclusion, I think, than, that since the symptoms are alike, the nervous centres affected must be the same.

SECTION II.

THE ANATOMICAL RELATIONS OF THE CEREBELLUM AND CONTIGUOUS GANGLIA.

299. We have two principles brought out which apparently contradict each other; namely, first, that the ovaria develope a large number of hysteric affections by their peculiar action on the respiratory ganglia; and yet we find, secondly, that the cerebellum and its connexions, the tubercula quadrigemina, are very frequently the seat of them. But, in fact, all these portions of the nervous centres are implicated, and if we trace their anatomical connexion we shall find a clue to the whole matter.

300. The reader is requested to turn to the anatomical rela-

[p] Revue Med., Jan., 1824.

tions of the respiratory ganglia, and having perused the following, he will then appreciate the important relations which the tubercula quadrigemina (optic ganglia) and the optic thalami (posterior cerebral ganglia) bear to the cerebellum on one side, the respiratory ganglia on another, and to the posterior lobes on another; and on reference to the chapter on the relations of the instinctive actions to the nervous system, (182,) he will see how intimately the whole series of relations which I have demonstrated throughout the work, are connected together in a series of links so closely joined to each other that it is impossible to separate them; and the whole chain uniting, apparently, the most dissimilar phenomena, as gout and the generative function; the latter and poisons; poisons and the passions.

301. The cerebellum is connected with the antero-lateral and posterior columns of the spinal cord inferiorly, and with the posterior lobes, posterior cerebral ganglia, and optic ganglia superiorly, and through these with the respiratory ganglia.

Mr. Solly thus arranges the fibres connecting the antero-lateral and posterior columns with the cerebellum.[q] There is a superficial and a deep set; one part of the superficial set crosses the surface of the cord immediately below the corpus olivare, emanating from the corpora pyramidalia, and decussating with those of the opposite side. Another portion takes the same direction posterior to the inner side of the *corpus olivare*, and as these fibres ascend to the cerebellum from the outer part of the *corpus restiforme*.

The deep set arise posteriorly, and are separated from the posterior columns by the posterior fissure.

The posterior columns, in ascending to the cerebellum, form a portion of the *corpora restiformia*, (which Mr. Solly names the auditory ganglia,) and are partly overlapped by, and partly interlaced with, the fibres from the antero-lateral columns. (*Op. cit.* p. 225.) In addition to these connexions of the cerebellum with the medulla oblongata, Gall states that fibres from the anterior pyramids cross in the *pons varolii* at right angles to commissural fibres from the cerebellum, and decussate in the proper sense of the word.[r]

[q] LXXXI. p. 155. [r] LXXX. i., p. 276.

With regard to the connexions of the cerebellum superiorly, Mr. Solly states, that the fibres on the surface of the *processus e cerebello ad testes*, and of the valve of Vieussens, (which is itself a ganglion,) may be traced distinctly to the optic ganglia. The external fibres of these processes go first to the side of the optic ganglia, from thence to the posterior cerebral ganglia, and (Mr. Solly thinks) to the hemispherical ganglia. The deep or descending fibres interlace with the ascending fibres of the sensory tract of the spinal cord, and then pass through the *locus niger* of the *crus cerebri*, to become continuous with the motor tract, and also with that portion of the fornix which takes its origin from this point. (202.)

302. These nervous connexions must not be considered as being confined to the cerebellum, for they distinctly bring the posterior cerebral and optic ganglia into relation, not only with the cerebellum, but also with the external and internal peripheries—that is, with the whole surface of the hemispherical ganglia, (167,) with all the mucous membranes, and with the muscular structures in general. How vast is the field of inquiry opened out by an application of the laws of the reflex function to these structures!

303. If we revert to the doctrine that all ganglia are formed upon the same type, (160, seq.,) and examine the anatomical connexions of the cerebellum, as just given, with other parts of the system, with special reference to the functions of the spinal ganglia, as demonstrated by Hall, Müller, and Grainger, —it would appear that the cerebellum corresponds in function to the posterior columns of the spinal cord, and that the optic, posterior cerebral, and hemispherical ganglia, (all extended surfaces,) have the same relation to the cerebellum, as the external periphery in connexion with each spinal ganglion bears to the posterior columns. In the latter case, if the peripheral nerves be stimulated, the movements of those muscles only are excited which are in connexion with the ganglion, while in the cerebellum we have a ganglion in connexion with the whole muscular system and the whole of the sensitive apparatus; so that, when in the ganglionic peripheries just indicated or in the mucous membranes generally, suitable changes

are excited and propagated to the cerebellum, combined movements may follow, analogous to the reflex; and this, I think, is the true pathology of convulsions in general, of the more extraordinary forms of chorea, as well as of choreal subsultus, however produced; whether by poisons, intestinal irritation, or the stimulus of developement at puberty.

304. Whether the cerebellum be the organ only of combined movements subservient to the conservation of the animal and the continuance of the species, or whether in addition it be the channel through which mental emotions act on the respiratory apparatus, is doubtful. There is certainly strong evidence in support of the doctrine, that the passions act on the body at large, through a medium of communication different from that of the will, (183,) and all facts tend to show that the channel is, partly at least, through the cerebellum; but the respiratory ganglia may also be acted on directly from the encephalic ganglia.

305. It is scarcely necessary to remark, that the hemispherical ganglia are affected in delirium, somnambulism, spectral illusions, and insanity,—indeed, in all the symptoms in which consciousness is involved. From a case contributed to the Guy's Hospital Reports by Dr. Bright, and others by Mr. Craig, and Dr. Craigie, in the Edinburgh Medical and Surgical Journal, it would appear that the optic thalami, or the parts of the hemispherical ganglia in immediate connexion, are implicated in spectral illusions. Little reliance, however, can be placed upon opinions derived from isolated facts, especially when they regard organs so extensively complicated as those of the encephalon.

CHAPTER VIII.

THE RELATIONS OF NERVOUS DISEASES TO THE EXTREMITIES OF THE SPINAL CORD.

306. Abundant evidence has been already produced in demonstration of the doctrine of sexual antagonism, as regards the two ends of the spinal cord, (Part I., chap. ii., sect. iii. and iv.,) the pelvic region having a superior developement in females, the thoracic in males. In some of the lower animals, there is no difference as regards developement of these regions, as in the entomoid classes, in which the last abdominal ganglion is frequently as large as the supra-œsophageal or cerebral.

It would appear that the empirical observation of the ancients had led them to some general anatomical views of this kind, if we may rely upon the following statement made by Cabanis: "Dans son traité du corps muqueux, Bordeu rappelant la doctrine des anciens touchant les deux grandes divisions du corps du l'homme, en gauche et droite d'une part; et en supérieure et inférieure de l'autre; doctrine que la pratique de la médicine confirme chaque jour, mais qui les mécaniciens modernes rejetaient, parce qu'elle ne paraissait pas appuyée sur l'anatomie; Bordeu, dis-je-a fait voir que les grandes distributions du tissu cellulaire se rapportent, en plusieurs points, a cette division qu'avait fournie aux anciens, la simple observation des phénomènes vitaux," &c.[s] Whatever may be the fact with regard to the doctrine of the ancients, it is quite certain that in hysteric or *neuræmic* diseases (143) a metastasis of disease from one end of the cord to the other takes place; for the symptoms im-

[s] LIII. ii., p. 411.

plicating the pelvic viscera will occasionally disappear, and vomiting, dyspnœa, cough, palpitation, and cephalæa supervene, to disappear in their turn at the menstrual or an hebdomadal period, with a completeness really surprising; and be replaced by menorrhagia, diarrhœa, ischuria, constipation, vesical paralysis, and neuralgic pains of the abdomen and lower extremities, or some other affection implicating organs in connexion with the dorso-lumbar portion of the cord. In a case of *neuræmic* affection recorded by Mr. Cockburn, and commented on by Dr. Craigie, this circumstance is particularly noticed.[t] Dr. Abercrombie relates an instance;[u] and others have been incidentally recorded, in which it occurred.[v] I have myself observed this general fact in three cases of aggravated hysteria, (for one of these see case XVII.,) and I feel no doubt that if practitioners will direct their attention to the subject, they will confirm these statements. The general fact is one of considerable utility, in the diagnosis and treatment of disease.

307. As a general rule, the pelvic viscera are implicated most frequently in those women in whom the reproductive system is highly developed, and most commonly at the menstrual periods. When the female resembles a virago, is past the middle of life, or has arrived at it without having had children, the thoracic viscera are most usually affected, so that angina pectoris, palpitation, and similar complaints, are most frequent in females of this description. In short, the nearer the patient approaches the masculine conformation, the more probably will the organs in connexion with the respiratory ganglia be affected.

[t] VII. xlvi., p. 32. [u] CXIX. p. 73. [v] XCIII. vii., p. 227.

CHAPTER IX.

RELATIONS TO THE LATERAL HALVES OF THE NERVOUS SYSTEM.

308. Some organs, from their position, influence the nervous system of one lateral half more than of the other; as the heart, liver, &c.; others are influenced by the arrangement of the blood-vessels, and act on one side in preference to the other, secondarily. Thus the left kidney is usually more diseased than the right, because the left renal vein has a longer course than the right, and the circulation through it is more liable to be interrupted, on account of its exposure to compression, as it crosses the vertebral column. In phlegmatia dolens, according to Dr. Burne,[w] in one case of twenty the right leg alone is affected, a fact explicable by a consideration of the course of the venous blood from the extremities. We can thus easily understand why varicocele and asthenic inflammation more frequently affect the left than the right testicle.

309. Since the ovaria and testes have a direct influence on the developement of other structures, it is worthy of inquiry whether the general law is applicable to them when in a state of disease. The affirmative would be, *a priori*, the direct inference; and individual facts support it. Thus in the hind shot by the Duke of Gordon, (36,) the horn grew on the same side as the scirrhous ovarium; the facial hair in man is frequently thinner on the left, than on the right side of the face, and acne is more frequent on one side than the other. In parotitis, the left parotid gland is more frequently affected than the right,[x] and the metastasis to the testicle is

[w] XIV. xxiii., p. 890.

[x] VII. iv., p. 304.

to the same side as the affected gland, that is, to the left. The left tonsil, left mamma, and even the left half of the lip, are, like the parotid gland, more frequently affected with scirrhus than the right; and, doubtless, the general law thus shadowed forth, influences all symmetrical parts, the innervation or nutrition of which is controlled by the reproductive organs.

310. It is remarkable that some difference in the right and left organs of generation exists in almost all classes of animals. Mr. O. Westwood relates various instances of hermaphrodite insects, one side being male, and the other female;[x] in the majority of instances the left side was masculine.[y] In the *boltenia reniformis*, (a tunicate animal,) according to Mr. Macleay, the left ovary is larger and less lobate than the right;[z] and, in the *dendrodoa glandaria*, the right ovary is altogether wanting.[a] In five specimens of the *ornithorhynchus paradoxus* which Mr. Owen dissected, the right ovary was altogether wanting in four, and in the fifth was much smaller than the left.[b] The oviducts and testicles in birds are at first equal in size, but the left alone attain that state of developement which qualify them for the sexual function. Mr. Owen says no exception to this rule has been discovered. In birds, the developement of these organs differs on the two sides, the right false kidney, out of which the testicles are formed, (265,) beginning to shrink, before the left has reached its full size, and having disappeared entirely at a time when the left is of considerable magnitude. In free martins, and those malconformed human beings who possess some of the characters of both sexes, an ovary is generally found on the left side, and a testicle on the right; and, when one testicle remains in the abdomen, it is usually the left.

311. This difference of developement of the organs in the right and left halves is not confined to the sexual organs. The liver, in the embryo, is a symmetrical organ, and assumes its usual form from shrinking of the left half: in lower animals this fact is more obvious,—as in the otter, in which

[x] Some of these are mentioned in Dr. Simpson's article on Hermaphrodism, in XVIII. ii. [y] XXIX. iv., p. 434.
[z] XXXII. xiv., p. 537. [a] Ibid. p. 547. [b] XXVII. 1832, p. 529.

there are five lobes, two larger on the right, two smaller on the left, and a small intermediate lobe. This general fact is obvious in the developement of the lungs of both man and lower animals. In the otter, for example, the right lung is composed of four lobes, the left of two; indeed, in every animal the right is the largest. In tadpoles the branchial cavity is closed completely on the right side, and the water is ejected through the opening which remains in the left;[c] in air-breathing gasteropoda, the pulmonic cavity is on the right side; and in serpents, which have but one lung developed, it is the right.[d] This general law may even be observed in the evolution of the teeth. The tooth or tusk of the narwhal is one of the canine teeth, enormously developed; it is much more frequently the left than the right; sometimes both have been developed.[e] This, however, being a sexual characteristic, equally illustrates the preceding paragraph.

312. It is worthy notice, that the ancients noticed the difference between the right and left sides, especially of the organs of generation. "If," says Hippocrates, "the right mamma, but especially the nipple, be the larger, it is a sign of a male fœtus; but if this be pale, and the left mamma and nipple be more tumified, then there is a female fœtus." "The least fallacious, and most certain mark, that a woman is pregnant with a male fœtus, is, that the pulse of the right hand is stronger, quicker, larger, and harder than that of the left, and *vice versâ* when the fœtus is a female."[f] "The right breast, and the right eye, have the greatest excellence, as well as the parts below on that side, for the males are born on the right side of the uterus."[g]

313. That the right extremities are superior in power to the left, is universally acknowledged, but that the right eye "has the greatest excellence," is not so generally known; but such is the fact. Let a person walk through snow to a point directly opposite to him, and he will find he is constantly swerving to the right of the point aimed at, and turning occasionally to the left; and, on looking back, he will find he has

[c] LXVI. § 408. [d] Ibid. § 413. [e] XXIV. p. 502.

[f] Ætius, Tetr. iv., Sermo iv., cap. 9.

[g] Hippocrates, de Morb. Epidem. Lib. ii., § 6.

not marched in a straight, but in a waving line, the first curve being to the right. The same hypothesis explains the zigzag course of footpaths. The arable and pasture land of this country is divided into parallel strips, called, (in Yorkshire,) "lands," or "samcasts," the division being marked by a furrow; and it is curious to observe how, in old enclosures tilled before hedges were planted, they bend to the left from the cause just mentioned.

314. Now, all nervous diseases do not attack the left side in preference to the right, for the right eye is more frequently affected by amaurosis than the left, although the left eye is more frequently myopic than the right. (Mackenzie and Wardrop.) It is obvious that the locality of the disease will depend upon its character, whether sthenic or asthenic, and upon its causes, as well as upon the progress of the disease; thus, since spasm in nervous affections precedes paralysis, if the whole system be gradually affected, the left side may be in a state of spasm, when the right is unaffected, and be paralyzed, when the latter is convulsed. However, of most functional diseases of the nervous system,—as chorea,[h] paralysis, tetanus, neuralgiæ, and local agues,—it may be remarked generally, that they are observed to affect the left side rather than the right. Even eruptive diseases attack the left side in preference.[i] Of thirty-two cases of strabismus, operated on by Mr. Lucas, twelve only were of the right eye.[j] Professor Stromeyer remarks, that tic douloureux affects only the left side;[k] but there are exceptions. He collected the cases of facial paralysis, related in the appendix of Sir C. Bell's work,[l] and he found that, in nine cases not depending upon local causes, &c., the left side was affected in six;[m] and exactly the same number of cases of torticollis, with similar results, are recorded in the work quoted. Of thirty-nine cases of torticollis cured by Professor Dieffenbach, by division of the contracted muscle, thirty depended on contraction of the right side muscle, and, of course, on paralysis of the left side.[n] Dr. Little mentions the general fact, as being observed in cases of

[h] VII. xlii., p. 229.
[i] Stoll, XLIII. iv., p. 206.
[j] XXX. ii., 1839-40, p. 525.
[k] CXXXVI. p. 107.
[l] LXXXII.
[m] Op. cit., p. 107.
[n] XXXVII. vii., p. 561.

talipes; I must remark, however, that this is not in accordance with my experience. I have operated on contracted tendons in seven cases, namely, two right arms, two right feet, and three left feet: the two right feet were those of boys; the two right arms those of girls. Mr. Hale Thompson states, that of 252 cases of lateral curvature, the curve was to the left side in twelve only; so that the left side muscles were paralyzed in 240 cases.[o] In a review of Mr. Coulson's work on deformities of the chest and spine,[p] Professor Stromeyer abandons his former explanation of this fact,[q] and advances the following:—Pathological observations prove that the heart is innervated more from the left side than the right; hence the left arm and side are less innervated, and, of course, are rendered weaker. He supports this view by some ingenious reasoning; but why is the heart innervated more from the left side than the right? The preceding facts, respecting the developement of organs, show that the cause of the greater weakness of the left side has a more recondite origin than this. Truly the elephant that supports the world stands on a tortoise, but how is the tortoise supported?

[o] XXX. ii., 1838-9, p. 132. [p] CXXXVII. Bd. xxi., p. 129.

[q] Namely, that it is the less use we make of the left side which renders it the weaker. "Der geringere Gebrauch, den wir von dem linken Arme machen und der seit Jahrtausenden schon dem Menschen-geschlechte zur Gewohnheit geworden ist, und der auch zum Theil gewiss auf irgend einem instinktmässigen Gefühle beruht, einen schwächenden Einfluss auf die respiratorische Thätigkeit dieser Seite gehabt habe," &c. CXXXVI. p. 109.

CHAPTER X.

RELATIONS OF THE NERVOUS DISEASES OF WOMEN TO THE PATHOLOGICAL CHANGES IN THE NERVOUS CENTRES.

315. In the present state of physiology and pathology, little practical benefit could be derived from a knowledge of the morbid changes which go on in the nerves, and nervous centres, in hysteria. They consist for the most part, probably, in impairment of the functions of the capillaries, or in actual changes in the molecular composition of the neurine, not amounting in extent to organic disease, unless from a long continued action of the exciting causes of these affections. The rapidity with which they appear and disappear, and the general fact, that the causes of them are evanescent, or in the circulating fluid, assure us of this. The opinion of Ehrenberg, that the decolorized globules of the retina and similar parts are formed from the blood-globules, is curious; he thinks they are "excreted from the vascular system, as grains immediately emancipated from the blood-globules, to whose relative size and composition, from still smaller globules, they come very near. The surface of the cerebral terminations [of the nerves] is probably, therefore, the single point in the whole organic system, in which we may recognise, with some definiteness, the deposition of globules of blood."[r] If this opinion be correct, we can have no difficulty in comprehending how agencies, which alter the composition of the blood, so readily affect the nervous system; since all

[r] VII. xlviii., p. 288.

the vital changes which it undergoes are dependent upon the action of the molecules constituting the nervous fibrils, as I have already shown. (172.) Close microscopic examination of the changes produced in the globules of blood, and of the ganglia, by nervine alteratives, would lead to important results, and afford a clue to the discovery of those excited by internal and external stimuli of the most recondite nature, as caloric, and the will. I am aware that the difficulties in the way of such researches are almost insurmountable; indeed, two very able microscopic anatomists, to whom I mentioned the subject, told me that they were altogether impracticable, namely, Dr. Henlé, the well-known assistant of Müller, and Dr. Langenbeck, of Göttingen, (nephew to the great surgeon of that name,) a most devoted anatomist, whose drawings of the microscopic anatomy of cancer are above all praise. Doubtless, the researches will be difficult in proportion as the object to be attained is great; but since this object is neither more nor less than the discovery of the changes excited in the nervous system, during perception, volition, and thought, surely an attempt should be made to attain it.

CHAPTER XI.

GENERAL DIAGNOSIS, PROGNOSIS, AND TREATMENT.

SECTION I.

DIAGNOSIS AND PROGNOSIS.

316. The rules laid down by writers for obtaining a correct diagnosis, are often in a great degree impracticable, or applicable to hospital practice only. It is necessary to have a previous personal acquaintance with the characters of diseases in general, to be able to distinguish one from another; without this knowledge no rules can be of avail; with it, they are almost unnecessary.

To enunciate a diagnosis, is to pronounce judgment according to the evidence the practitioner collects,—often under great difficulties. He cannot always be kneading the abdomen, or stethoscopizing the chest, or inspecting the mammæ, uterus, &c. So that it is necessary to correctness in diagnosis, that he not only have a sound judgment, but acute, patient, persevering, and flexible powers of observation,—qualities to be obtained only by diligent labour, and devotedness to the practice of the profession. When a practitioner can collect the evidence quickly, compare it readily, and decide correctly, he is in possession of that inestimable quality, tact.

317. Practitioners endowed with tact practise instinctively the method of comparison and exclusion; they compare certain symptoms, and infer that the affection is *not* of a certain class of diseases; consequently, the field of inquiry is limited;

or they limit the field again, by inferring that the affection must belong to a certain class, and no other. Thus, a patient having a distinct arthritic diathesis, it may be fairly inferred, that whatever the disease may be by which he is attacked, it will be of a gouty character, and require appropriate treatment.

318. A more or less minute inquiry, upon all points mooted in the preceding pages, and a knowledge of every variety of the disease, are necessary to the acquirement of a thorough general history of a complicated case of hysteria, and to its correct diagnosis, whether for the purposes of prognosis or cure. The pathological biography of the patient, from infancy to the period of disease; her peculiar diathesis, her hereditary predisposition, the state of the ovaria as indicated by those structures which they influence, the relations of the symptoms to these structures, to one another, to the exciting or proximate causes, and to the predisposing,—as pathemic, depleting, poisonous agencies, &c.,—must all be clearly made out. These, from the previous observations upon them, the reader will easily arrange and study for himself.

319. *Hysterical Expression.*—There are certain peculiarities in a hysterical patient, which ought not to be passed over, because they are very useful in limiting the field of inquiry. These, in the aggregate, have been termed the hysterical manner, or expression. It is difficult to define this hysterical expression. It often closely resembles that of the insane; it indicates an irresoluteness of mind, a confusion of ideas, or a listlessness and inanimateness, as if the patient cared nothing about the world or its affairs. The manner of the patient is characteristic of impatience, restlessness, hurry, and fidgets. Questions are answered in monosyllables, or not at all. The pain experienced is always acute, and greater than is warranted by the general indisposition; a slight touch, or even the attempt to touch the part complained of, will cause the patient to shrink, and sometimes to scream. When this hysterical expression and manner is well marked, it will lead the practitioner into a short and ready line of investigation, because it enables him to exclude the two large classes of fevers and inflammations; since it is only present in these

affections during the convalescent stage, or at the first onset of exanthematous fevers, and then the accompanying phenomena alter it considerably.

With regard to special symptoms, I have treated of their diagnosis when necessary, in the succeeding Part; and the diagnosis of the general causes require no further illustration. There are two exceptions however, namely, the hereditary predisposition to nervous disease, and the arthritic diathesis; and these I shall notice.

320. *Diagnosis of the Hereditary Predisposition.*—If the practitioner were to inquire directly of his patient or her friends, whether any of her relatives were or had been insane or epileptic, he would be in danger of either losing his patient, or of being deceived. All inquiries, therefore, in which the feelings may be wounded, should be made indirectly.

321. All nervous diseases of a paroxysmal kind are known under the various names of fits, trances, asthma, &c. Family eccentricity of temper, so often indicative of predisposition to insanity, may be ascertained by a soothing inquiry into the domestic troubles and grievances of the patient, when the infirmities of manner and temper of her near relatives will be manifested. Nervous diseases often leave marks of their previous existence in families, in the various deformities from paralytic and spasmodic affections, as talipes, strabismus, scoliosis, &c.

322. *Diagnosis of the Arthritic Diathesis.*—The external conformation of the patient or her relatives, is one means by which this may be ascertained. A hale gouty old man, or even his children, has the capillary vessels of the cheek developed so much as to give the appearance of ruddy health; there is considerable corpulence, the hair early becomes grey, the head is seldom bald, the teeth are regular and perfect. But when the constitution is debilitated, the small blood-vessels on the cheek are few, and meander thinly over the sallow cheek, the eyes lack lustre, the lips are bluish, the teeth are covered with tartar, loose, or nearly all gone, and the patient is often very infirm from rheumatism, &c. In the hale old man, the gout is sthenic, and appears in regular paroxysms, in the other it is manifested as rheumatism, gravel, angina

pectoris, and the various diseases mentioned before. (260.) The children of gouty parents love animal food, and are very fat. A great deal of tact and discrimination will be necessary in conducting this part of the inquiry. If there be any doubt, colchicum, or hellebore, may be employed tentatively. Whenever important questions of this kind are left unsolved, the treatment can only be empirical and uncertain.

322. Prognosis. No rules for prognosis can be laid down, which may not be readily inferred from the previous remarks; it is in general favourable.

SECTION II.

GENERAL TREATMENT.

323. THERE are three well marked forms of hysteria, namely the common, the sthenic, and the asthenic, or aggravated, each presenting modifications, varying as their causes.

In the treatment of hysteric affections in general, it is of importance to remove all stimuli. All things and all occasions, by or in which the imagination may be excited, should be forbidden; as the society of licentious men, balls, novel-reading, much music, sentimental songs, the sight of vivid colours, &c. The patient should be required to go to bed only when sleepy, and to arise in the morning on waking; to abandon the use of tea, coffee, stimulating liquors in general, and scents, especially of the musk class, of which young women are very fond. The propensity to satisfy pica (Part III., chap. iv., sect. i.) should be closely watched, and flesh-loathing relieved as much as possible. Some patients abstain not only from animal food, but also from salt,—a condiment absolutely necessary to health. The errors in diet are often in the other extreme. Mr. Carmichael, speaking of those ladies who, in consequence of the enjoyment of a carriage, seldom use their legs except in a ball-room, says, "Either let their lunch be their only dinner, or let them be satisfied with a light sandwich or a biscuit; or, if they prefer it, let them

continue to force their delicate appetite with two dinners daily, sit tightly laced in their carriages, and take physic."[r] Bustles, and pads on the mammæ, or compression of the latter, are equally as injurious as tight lacing. The system should at the same time be brought into a healthy tone by regular and daily exercise, by travelling, sea-bathing, and shower-baths twice or thrice a week. The patient should, if possible, be inspired with a taste for the natural sciences, as botany, chemistry, &c., and for all employments of the mind, so that she may have no time to muse on her ailments, and "thick-coming fancies."

324. Exercise in the open air and occupation of the mind are sovereign remedies in hysteria. Sydenham laid great stress upon them. Baglivi cured two women most severely affected, by gestation continued for many months; and a hypochondriac given up by every one, by equitation in the country. Muscular exercise exhausts the irritability of the sensitive system, while it strengthens the respiratory and alimentary. I think every thing should be made subservient to exercise in the open air, change of scene, and occupation of the mind; medicine should only be administered as a palliative and a succedaneum, or to meet special predisposing or exciting causes. A work of Sir James Clark[s] contains many most valuable remarks on this subject.

325. Hysteria is often seen amongst sempstresses, lace-workers, and others of the female population of large towns, confined for many hours daily at sedentary employments, or in heated manufactories; and who, from associating in numbers, excite each other's passions. It is vain to recommend change of air and travel *to them*. Would that some influential individuals would associate to ameliorate their condition by obtaining them other employment. Designing patterns for calico-printers, paper-stainers, &c.; or waiting in the shops of booksellers, drapers, haberdashers, &c., would be suitable and profitable employment for the women of the lower classes, and much less injurious to their health and morals.

326. Derangement of the general health should be met by

[r] XXXV. xiii., p. 295. [s] The Influence of Climate in the Prevention and Cure of Chronic Disease. 8vo. London, 1829.

suitable remedies. Amongst the metallic tonics small doses of mercury (even to very slight ptyalism) and iron are the most efficient, combined with bitters. Of the latter, aloes, quassia, calumba, wormwood, and chamomile are most recommended. I have found very minute doses of colocynth answer remarkably well,—gr. ¼ to ⅛ every six hours. It may be observed that in general all medicines, but especially the metallic remedies, are most efficient in hysteria, when given in minute doses.

There are principles of treatment applicable to some special genera of nervous disease, which must have brief notice.

327. *Treatment of Hereditary and Anomalous Hysteria.*—The metallic remedies are peculiarly applicable to this class. Mercury may be given with advantage, and the oxides and salts of zinc, copper, silver, and arsenic are all very efficient. The grey oxide of zinc, according to Dr. Sementini,[t] is exceedingly useful in irritative debility, and as an antispasmodic and tonic. The dose is from a fourth to half a grain, increased one half every second day. Bismuth has also been strongly recommended. These metallic tonics are useful in both the neuralgic and spasmodic affections, and may be benefically combined with vegetable narcotics, especially those which act specially upon the ganglia at the base of the brain. (298.) Of these, stramonium is much to be preferred; then hyoscyamus, belladonna, conium, lactucarium, and probably spider's web, which has been found very useful in temulent excitation. In this class of cases prophylactic treatment is of the first importance.

328. *Arthritic Hysteria.*—In these cases the alkalis, colchicum, (I prefer the acetous extract from experience of its utility,) and black hellebore, may be combined with a general tonic treatment. I have found the following formula very useful in all cases of this character; in some its effects are almost magical:

R. Ferri Sulph. gr. xv.
Pulv. Colocynthidis, gr. ii.
Pil. Hydrargyri, gr. xii.
Extr. Colchic. Acet. gr. ix.
—— Gentianæ, gr. xxx. M. et fiant pilulæ xii.
One to be taken three times a day.

[t] XXXVII. vii., p. 567.

The nitrate of silver, or the sulphate of copper or zinc, might be advantageously substituted for the sulphate of iron in some cases; and the extract of belladonna or stramonium added when indicated. A bitter infusion might be administered contemporaneously. In cases of this kind in which there is great debility, and danger may be anticipated from the depressing effects of the colchicum, black hellebore may be substituted for the latter; and a few grains of iodide of potassium given in each dose of the bitter infusion. Salt-water bathing of the lumbar region, stimulant liniments and mercurial plasters to the loins; the use of the waters of Barêge, Wildbad, &c., will all be of service. Pomme strongly (and I think justly) recommends long continuance in the warm bath daily; and it is remakable that in the cases he relates, as illustrative of the good effects of his plan of treatment, the individuals were of the arthritic diathesis. The best aperients are the mineral waters, or imitations of them. Counter irritants may be mentioned amongst the tonics and palliatives suitable for this class of diseases; blisters, setons, issues, are more useful in these than in any other.[u]

329. *Treatment of Metastatic Hysteria.*—This, I believe, is a modification of the preceding (328); a useful hint may at least be derived from the phenomena of this class. When the head and thoracic viscera are endangered in a severe attack, it is useful to derive to the pelvic viscera as much as possible. This object may be attained by pediluvia and semicupia, frictions on the abdomen and loins, dry cupping, sinapisms, and other counter-irritants to the extremities and pelvic region, and the use of hellebore, colchicum, lytta, &c., both internally and externally; all being most effectual at the menstrual periods.

330. *Treatment of Pathemic Hysteria.*—When hysteria follows violent emotion, bleeding according to the strength of the patient should first be practised, with sudden cold affusion on the head, and followed by hygienic treatment. In these cases the maxim holds good, "similia similibus curantur."

331. *Treatment of Ovarian Hysteria.*—By ovarian hysteria, I mean that form induced by a sexual developement above

[u] XV. i., p. 93.

par; it is not necessarily marked by erotomania or nymphomania, but rather by a high degree of irritability of the system with considerable plethora. It is in these cases that the musky and fœtid gums are more especially of service; and that marriage cures. If there be an asthenic state of the system co-existent with this sexual irritation, the diffusible stimulants and metallic tonics will be beneficially combined with the fœtid remedies.

332. Treatment of Sthenic Hysteria.—In some few cases of hysteria (especially of the last-mentioned kind) there is a full pulse, considerable appetite and corpulency, plumpness and ruddiness of the face, and signs of cerebral congestion. The embonpoint and ruddiness should be carefully distinguished from those observed in lingering cases in which there is great debility. The means of cure are obvious, namely, purgatives, occasional leechings, spare diet, and much active exercise.

333. The general principles to be followed in treating hysteria from other causes, may be deduced from the principles developed in the preceding pages, or from the details in Part III. In reference to all, I may adopt the remark of Baglivi with peculiar propriety: "Quod spectat ad peculiarem cujuslibet morbi curationem, arbitror illam rarò feliciter cessuram, nisi ratio observationi adjungatur. Mille namque morborum causæ, varia ægrorum temperamenta, ætates, vitæ genera, climata diversæ naturæ, variæ annorum constitutiones, et varia semper influentes; innumera denique alia, quæ ad producendos fovendosque morbos concurrunt, ita interdum certam constantemque morbi et suorum symptomatum naturam perturbant, ut difficile sit veritatem investigare, nisi complexus horum omnium sagaci rationis usu perpendatur, et illustretur."[v]

[v] Praxeos Med. Lib. i., cap. ii., § 12.

PART THE THIRD:

SPECIAL PATHOLOGY & THERAPEUTICS.

INTRODUCTORY REMARKS.

The systematic arrangement of the nervous diseases of women is a difficult task; I think it impossible to devise such an one as shall be free from objection. Perhaps the most convenient will be an arrangement based upon the special physiology of these diseases. The symptoms implicating the skin, the lumbar viscera, the lungs, heart, and thoracic region, and lastly, the muscular, sensitive, and sensorial apparatus, will be examined separately, both as respects their nature and cure, and so this part of the work will constitute a dissertation on the semeiology of these diseases, and comprise special diagnosis, prognosis, and treatment. Perhaps, in my anxiety to be explicit, I may be guilty of some repetition; this I pray the reader to excuse.

CHAPTER I.

THE SYMPTOMS OF NERVOUS DISEASES IMPLICATING THE CUTANEOUS STRUCTURES.

SECTION I.

SYMPTOMS IN WHICH THE SUBTEGUMENTARY TISSUE AND THE MAMMÆ ARE AFFECTED.

a. The Mammæ.

On account of their close connexion with the ovaries, the mammæ have many symptoms referred to them in hysteria.

The areola is partially developed, and its colour darkened very constantly; sometimes the gland becomes hypertrophied, and the organ pendulous, especially in lascivious girls affected with hysteria.

Titillation, formication, and analogous sensations in the mammæ are not uncommon in hysterical females in whom the cessation of the catamenia is impending; sometimes leading them to suppose themselves pregnant.

Neuralgia of the mammæ, especially of the left, is a very common symptom, the breast being exquisitely tender, and sometimes presenting slight glandular enlargement. It is always painful and alarming to the patient, but should be carefully distinguished from schirrhous disease. The age, general appearance, and habits of the patient, together with the exquisite sensibility of the surface, and attendant uterine symptoms, will enable the practitioner to distinguish between the two diseases. The neuralgic affection is most common in young women, is greatly aggravated at each menstrual nisus, extends down the arm, or to the hip, and is usually accompanied by other symptoms of hysteria. It differs altogether from the pain *beneath* the left mamma observed in hysteria, and often complicated with chlorosis.

Treatment of Neuralgia of the Mammæ.—The general health of the patient should be our first object, and each menstrual period should be anticipated by prophylactic measures. Stimulant purgatives with mineral tonics, tonics previously and during the paroxysm, the application of cold water or opiate plasters, with camphor or opium administered internally. Dr. Rowland has found cupping over or applying leeches to the sacrum to cure the disease; others recommend counter-irritants to the spine.

Discharges of Milk, Blood, or Urine, from the Mammæ. — When the flow of milk which occasionally occurs in hysterical females amounts to galactirrhœa, hemlock poultices externally, and pills of opium and hemlock internally, have been useful; when checked, however, a sanguineous discharge and severe neuralgia have supervened. The flow of urine from the mammæ is too rare to require notice. Blood sometimes drops *guttatim* from the nipple, and sometimes

there is nothing more than venous congestion, indicated by enlargement and turgescence of the veins, occasioning ecchymosis, and extending occasionally down the arm of the affected side, and even to the finger ends, which assume a reddish blue or mottled appearance. There is exquisite sensibility of the organ. The treatment is the same as that for neuralgia. Sir A. Cooper has detailed several cases;[a] one of these is the following.

Case I.—A young lady, aged seventeen, has a bruised appearance of the breast; there is one larger and several smaller extravasations, like those which leeches, had they been applied, would have produced under the skin. This extravasation of blood, to which she has been repeatedly liable, begins about a week before, and disappears a week after menstruation.

b. The Subtegumentary Cellular Tissue.

The embonpoint of the hysterical has already been cursorily noticed. (41.) It is one of the most remarkable symptoms of hysteria, and deserves close observation from the practitioner, as it affords him one of his best elements both of diagnosis and prognosis. The less food the patient takes, and the more she exhibits a brilliancy and delicacy of finish, the more certainly is the disease hysterical, however apparently severe it may be. It is a very hopeful symptom. A female thus formed will triumph over the most prolonged anorexia, the severest forms of nervous disease, as coma, catalepsy, paralysis, and tetanus; and even over the crowded leech-glass, the scarificator, and the lancet,—the use of which is so dangerous in many of these cases. After extraordinary sufferings the catamenia appear, or the patient acquires a lover, or marries, and perfect health follows. When remarkable embonpoint appears in young females, accompanied by hypertrophy of the mammæ, there is unquestionably a morbid state of the ovaries.

[a] XCII. Part i., p. 81.

SECTION II.

THE SECRETING STRUCTURES IN THE CUTIS VERA.

a. Profuse Perspirations.

PARTIAL sweats are very usual on the forehead, chest, abdomen, and across the loins. Both Whytt and Sydenham observed the sweats of the hysterical, and compared them to the other profluvia observed in these affections. The secretion is more profuse, especially across the loins, when there is renal ischuria; but in those cases in which there is simulated rheumatism, the skin being alternately hot and cold, the pulse quick, and many of the symptoms of fever, the perspiration is generally most profuse. I have elsewhere recorded a case of this kind,[b] which came under my own observation in the York County Hospital, in which there were neuralgia of the heart, spinal column, and hip; vicarious hæmoptöe and hæmatemesis; dyspnœa, palpitation, embonpoint, and dislike of animal food; with ischuria renalis, and various other symptoms. The perspirations were so profuse that the sheets of her bed, and her shift became as wet as if dipped in water; and large drops would stand upon her face. I was of opinion, that in this case the neuralgic irritability of the heart, (for its action was exceedingly tumultuous, the strokes varying in frequency from one hundred and fifteen to one hundred and fifty-five per minute,) by hurrying the circulation, induced the profuse sweats; since they have been observed in other cardiac affections distinguished by excessive action.

b. Cutaneous Eruptions.

Herpetic and other eruptions have been frequently noticed in the nervous diseases of women. They are principally observed in individuals with what may be termed the scorbutic or gouty diathesis, but are occasionally acute diseases resembling pemphigus, the miliary eruption, or a pustular disease; but rarely the latter. They require no particular notice,

[b] VII. xlix., p. 441, Case 36.

except that their possible existence in nervous women should be borne in mind, because they are not only less dangerous, but the treatment need not be herculean. When the eruption assumes the form of chronic herpes, or that of prurigo, the administration of small doses (one or two grains) of blue pill and acetous extract of colchicum, combined with the alkalis in bitter infusion, will be the best treatment.

c. Vicarious Menstruation; Hæmorrhages from the Skin.

Vicarious menstruation ought, if possible, to be distinguished from local hæmorrhage or purpura. No flow of sanguineous fluid at the menstrual period except that from the uterus can strictly be considered catamenial. Cases of this kind, however, are often mentioned in medical writings, so far back as the time of Hippocrates, as instances of vicarious menstruation. The latter writer expressly states its occurrence from the nostrils,[c] stomach, lungs, and bowels, by stool.[d] Boerhaave enumerates the organs from which vicarious menstruation occurs as follows:—the eyes, ears, nostrils, gums, salivary glands, œsophagus, intestines, bladder, mammæ, skin, wounds and ulcers.[e] Van Swieten, in his comment on this aphorism, quotes several very interesting cases.

As the flow of the catamenia was, and is, considered necessary to the health of the system, the attention of both physician and patient has ever been closely directed to this point; but if the doctrines I have advocated be correct, it is obvious that vicarious menstruation (like menstruation itself) is nothing more than a symptom of the periodic monthly excitement of the whole system, developed under accidental circumstances in other organs than the uterus. Consequently, the consideration of this form of disease falls under the general head of Hysterical Hæmorrhages.

Hysterical Hæmorrhages.—These may be divided into two classes, according as they are in connexion with little or much derangement of the general health. When the general health is little deranged, the hæmorrhages occur only at the monthly nisus, and from organs in intimate connexion with

[c] Aphor. § v., 33. [d] De Morb. Mulier. i., cap. v. [e] Aphor. 1286.

the ovaries. In the other case, they appear under two forms, one resembling purpura, or the scorbutic diathesis, as exhibited in spongy gums, fœtid breath, great tendency to ecchymosis, debility, and loose crasis of the blood; another, in which, although the blood be impoverished, there is rather a highly excitable state of the nervous system, influencing the capillary circulation, and aggravated by depletion and want of exposure to the air, and of exercise. In this kind of hysterical hæmorrhage, although the flow may occur from any mucous surface, yet it principally takes place from organs in connexion with the ovaries. The following, communicated to me by my friend Mr. Thurnam, deserves record.

CASE II.—*Amenorrhœa, with Epilepsy and Vicarious Menstruation.*

Marianne Burns, a cook, had good health until the period of puberty. When sixteen years of age, she first menstruated slightly, after having suffered during three months from pain, with giddiness and throbbing in the head. At, or directly after the first menstruation, she was seized with epileptic fits, which for six months came on daily, and often two or three times in the day and night. She was bled, leeched, and repeatedly cupped; her head was shaved and blistered, and mercurial ointment used to salivation. After being "brought very low," at the end of half a year she recovered; the catamenia reappeared very regularly every month, but very scantily, continuing two days at each period.

Notwithstanding the deficient menstruation, she continued well until her twenty-second year, when the epileptic fits returned,—one or two at each menstrual period. The paroxysms came on without any premonitory symptoms, and she was often thrown out of bed with great violence during the attacks, and even stated that, at different times, the clavicle, radius, tibia, and three ribs, had been broken. She became an in-patient of St. George's Hospital for several months, on two or three occasions; the treatment resorted to was chiefly depleting, and consisted especially in the application of great numbers of leeches to the groins; but she only obtained partial and temporary relief. She continued in the state just mentioned for about a year-and-a-half, when she became much worse. The catamenia ceased altogether, and the fits became more numerous, especially during one week in each month; indeed, she was often quite free from fits during the other three weeks. At the end of two months she began to lose blood from the eyes, ears, and by hæmoptysis. The bleeding was most abundant in the week (doubtless that of the uterine nisus) during which she suffered from epilepsy. She was subject to pains in the loins, and all over the chest, especially on deep inspiration. There was no leucorrhœa, the appetite was indifferent, the bowels free.

The catamenia had been entirely absent, and these symptoms had con-

tinued six months, when she came under Mr. Thurnam's notice, on her admission into the Westminster Hospital, March 22nd, 1837, and gave him the preceding history. Her complexion was somewhat dingy, and there was a dark zone under each eye; she was tolerably stout and fat, and appeared to possess ordinary muscular power. She complained of occasional noises in the ears, with a more constant shooting pain in the vertex, which was aggravated by exercise; there was pain on pressure in the left iliac region, and the abdomen was tympanitic, especially after the epileptic paroxysms. The nurse reported, that bleeding took place from the inner canthi of the eyes; there had been pain and dimness of sight in the right eye since the bleeding. The pulse was calm and regular, the tongue white and slightly furred.

The patient was directed to take every night two pills, containing of aloetic, galbanum, and blue pill, each three grains, and ten grains of the compound steel pill, twice a-day, and to have middle diet with meat. Two days after admission, she was thrown out of bed in a severe epileptic fit by the spasms; for which eight leeches were ordered to be applied behind the ears. In a week's time she menstruated scantily, for the first time during seven months, and had lumbar and coxarial pains. She left the hospital before the next period, having some sentimental attraction out of doors, but soon found her way back to St. George's Hospital.

This was a suitable case for the administration of stramonium and aconite with silver or copper.

These hæmorrhages deserve a cursory notice, and may be examined as they proceed from the surface of the body, or from the viscera. The former only will be noticed now; the latter will be noticed in the chapters proper to each.

It is a remarkable fact, that in the greater number of instances, they have occurred from the eyes and ears; then from the inner canthi, or side of the nose, the nostrils, the cheeks, and epigastrium, the mammæ, the umbilicus, the feet, and ulcers on the legs; from the axillæ, neck, anterior surface of the thorax and abdomen, the surface of the arm, and from the finger-ends.

In two cases of sanguineous ephidrosis of the feet which came under my observation, the discharge only occurred during the menstrual period, when any extra exercise was taken. The subjects of these were a mother and daughter, both of a very hysterical habit, and subject to various nervous affections. In a case of sanguineous discharge from the umbilicus, in the York Hospital, a mucous matter was also discharged in the intervals of the menstrual period,

having a fæcal odour. The same patient had hæmoptöe and sanguineous discharge from the ears. These hæmorrhages will not only occur at each monthly nisus, but not unfrequently also at quotidian, tertian, or hebdomadal periods. They are usually accompanied by pain and irritation of the structures implicated; the general sanguineous ephidrosis has been accompanied by a pustular eruption.

These anomalous affections have been successfully treated by sedatives, of which lactucarium is the best, and by general tonics.

CHAPTER II.

SYMPTOMS OF NERVOUS DISEASES AFFECTING ORGANS IN RELATION WITH THE DORSO-LUMBAR PORTION OF THE SPINAL CORD.

SECTION I.

THE UTERUS.

The state of the uterus, as the most important appendage to the ovaria, and the most intimately connected with them of any organ, cannot but have an important bearing upon the pathology of our subject. As has been repeatedly stated, much stress is laid upon the state of the uterus, as indicated by the due flow of the catamenia, in many cases with very erroneous views of its relation to the general health. It probably has a much less important influence on the economy than the renal secretion. Its due flow indicates that the hepta-periodic movement is normally performed as regards the uterus; and its suppression is a sign that the movement is in some way interfered with; but I think is rarely a cause of the symptoms which accompany such suppression, these being seated rather in the nervous centres, or dependent upon the state of the blood. And so also when, after suppression, the menses reappear, we are in error when we say the renewed flow is the *cause* of the returning health; it is simply a *sign* that the periodic movement is normally performed; and, consequently, that the system has recovered its healthy tone. It therefore differs in no degree from other signs of restored health, as manifested when the secretions from the kidneys, bowels, &c., become normal; only it is more tangible, more evident, and more observed, from prejudices and custom.

In the same way, a menorrhagia may indicate a cessation of that state of the system which has caused the cessation of the uterine secretion; and may, when profuse, be a useful derivative in those affections implicating the head and chest. In such cases it should not be interfered with. The consideration of altered catamenial secretion, when dependent upon causes affecting the general health, will be best entered upon in another part of the volume: at present, remarks must be confined to the special affections of the uterus and vagina, the principal of which are neuralgia, and paralysis of the uterine nerves, and (dependent upon these) dysmenorrhœa, amenorrhœa, menorrhagia, and leucorrhœa.

Amenorrhœa.—In females of debilitated habits, the catamenial fluid is apparently suppressed, from an absence of the colouring particles. This occurs particularly in chlorosis, in which females will often state that they are not "unwell" at the usual period, but have "the whites." In cases where there is paraplegia, or vesical or renal paralysis, the nerves of the uterus seem to suffer in the same way, and the catamenial secretion is altogether arrested.

Dysmenorrhœa.—Irritable Uterus.—Frequently, however, the uterine nerves fall short of this paralytic state, and then become exceedingly irritable, giving rise to neuralgia and its accompanying phenomena. This more particularly happens in females of a nervous, hysterical habit, but who do not suffer from the more severe forms of nervous disease. When the neuralgia is developed at the monthly period only, it is termed dysmenorrhœa. This affection is characterized by acute pains, resembling those of labour, heaviness and weight about the loins, tenderness of the cervix uteri, which, according to Lisfranc, is in size as if the patient were in the second month of pregnancy; the vagina is also hot. The bowels are constipated, the renal secretion altered, usually diminished in quantity; the nerves of the lower extremities frequently so affected that sensations of numbness are excited; the appetite is affected, there being pica, anorexia, or strange longings; the countenance is generally pale, the temper is capricious, the head aches. There may be either menorrhagia, leucorrhœa, or amenorrhœa.

When these symptoms occur between the monthly periods, and are in some degree constant, the erethism of the uterus almost amounts to inflammation, and a lymph-like substance is formed on its inner surface; the affection is then termed irritable uterus. This may be periodic, and recur regularly every one, two, or three weeks.

Intermittent Neuralgia of the Uterus.—Like other neuralgiæ, that of the uterus is excited by causes of the intermittent class, and requires a modified plan of treatment. The following case is an interesting example of this form of the disease.

Case III.—Madame R. C., aged twenty-eight years, tall and robust, was safely delivered in the beginning of October, 1827. She did not nurse her child, and the catamenia were re-established in six weeks, continuing regular until the month of February, 1828, when they were suppressed without any ostensible cause, but again returned eight days after the expected period, accompanied by extraordinary pains, chiefly affecting the right iliac region, shooting into the pelvis, and extending towards the opposite iliac region. These pains were accompanied by a bearing down, resembling that felt in labour. They were acute, lancinating, recurring every three or four minutes, and forcing the patient to cry out from their violence. They soon induced a degree of delirium, and even convulsions. These attacks came on about mid-day, and lasted, with more or less intensity, until evening, ceasing about midnight, and then permitting the exhausted patient to sleep. In the morning she appeared in good health, and remained well until noon. When the attacks had recurred daily for eight days, as the catamenia continued to flow, an accoucheur was consulted, under the idea that the patient was suffering from abortion. It was decided, however, that the affection was inflammatory, and venesection, leeches, diluents, and the usual antiphlogistic remedies were prescribed; but, instead of relieving, they greatly aggravated the paroxysms. Dr. Duparque was called in on the 14th of March, the twenty-fifth day of the disease. He found the patient reduced to a state of complete emaciation, the appetite being nearly natural, the tongue moist and clean, the skin a little hot, the pulse quick and irregular, the abdomen soft and insensible to pressure, but this pressure exciting some pain in the iliac and hypogastric regions; yet nothing particular could be detected by manual examination. The os uteri felt rather turgid, and more open than natural, but not more so than during the catamenial period. The disease was considered and treated as a regular intermittent; and eight grains of the sulphate of quinine were ordered to be taken during the next remission. The paroxysm did not return at noon, and only a few mitigated pains in the evening. There were no more attacks, but the patient continued the quinine for some days by way of precaution."[f]

[f] XCIII. New Ser. ix., p. 530.

Menorrhagia, Leucorrhœa.—In neuralgia of the uterus there is the same state of the secreting surfaces affected as in other neuralgiæ, tic-douloureux for example, which often excites profuse lachrymation. Similar states of other secreting organs is observed in hysteria. Hence the diabetes, diarrhœa, and salivation of the hysterical; and their converse, ischuria, constipation, and a typhoid dryness of the mouth. So in neuralgia of the uterus there are various states of the catamenial secretion, from profuse menorrhagia to complete amenorrhœa.

When the excitement extends to the vagina, which is usually the case, and implicates the mucous glands imbedded in its structure, particularly those about the cervix uteri, there is leucorrhœa. When the disease occurs about the cessation of the catamenia, there is danger lest it excite scirrhous of the uterus.

Treatment of Neuralgia of the Uterus and its Complications.—As neuralgia of the uterus rarely occurs but at the menstrual period, a prophylactic treatment should be adopted in the interval. The general tone of the system should be increased by suitable means; the bowels regulated; an opiate plaster or ointment of veratria applied to the sacrum; and the loins sponged with a strong solution of common salt. Just before the supervention of the expected attack, the patient should adopt and keep the recumbent position, and take a mercurial alterative combined with opium. Blue pill, and compound powder of ipecacuan, of each two or three grains, taken three or four times a day, is a combination the good effects of which I have repeatedly observed. Dr. Campbell recommends the use of infusion of the ergot of rye, both during the interval and in the paroxysm. Some of the preparations of colchicum might be tried in a similar manner when other remedies fail, especially if the patient be of the arthritic diathesis, and the disease take the form of rheumatism of the uterus.

During the attack, cold-water injections, or solutions of opium or assafœtida, have been found useful thrown into the rectum or vagina; if there be menorrhagia, a cold strong infusion of tea might be usefully substituted for these; and cupping glasses applied to the mammæ, as recommended by Hippocrates, or between the shoulders. If necessary, leeches should

be applied to the groins, vagina, or cervix uteri, (by means of a syringe or glass tube,) with pediluvia and semicupia. Extract of hyoscyamus combined with camphor and opium, in full doses, has been much recommended; probably a mercurial would increase the efficacy of this combination. Mr. Hunt has found small doses of arsenic useful in allaying the menorrhagia and neuralgic pains, as well in carcinoma as in the purely painful diseases of the viscus,[g] a circumstance highly probable from the well-known peculiarity of the action of that metal upon the sexual organs.

If the disease occurs every week or fortnight, the preceding treatment will be the best; but if it assume the quotidian, tertian, or quartan type, quinine and arsenic are indicated.

Hypertrophy of the Uterus; Simulated Pregnancy; Nervous Pregnancy of French Writers.—From the moment of conception, the uterus and ovarium begin to enlarge. There is, however, an affection of that viscus, or of the ovaries, observed occasionally in hysteric females, which has been termed simulated pregnancy, in which the abdomen enlarges gradually, and sickness, sensation of movements in the abdomen, and other signs of pregnancy supervene, the catamenia being suppressed, the mammæ enlarged, &c. One case is on record in which all the symptoms of pregnancy and parturition occurred regularly every nine months for twenty years.[h] This affection did not escape the notice of the ancients. Hippocrates attributed it to inflammation of the uterus, and mentions, as the accompanying symptoms, amenorrhœa, distaste for food, vomiting, pain of the abdomen and loins, and a flatulent distension of the body to such an extent as to lead to the suspicion of pregnancy. Besides this, there is tumour of the abdomen, sometimes hard, sometimes soft, which, just as in pregnancy, goes on increasing for ten [lunar] months, when the belly begins to fill with water, and the navel is prominent. On examination *per vaginam*, the cervix uteri will be found small and low down.[i] Mr. Tate remarks, that the enlargement is substantial, and not a mere accumulation in the colon.[k] Dr. Conolly thinks it is "a mixed state of vas-

[g] XLV. xxi., p. 277.
[h] XCIII. i., p. 495.
[i] De Naturâ Mulieb.
[k] XCVII. p. 111.

cular fulness and tympanitic distension."[1] Jules Hatin asserts, that the uterus is always in a normal state, and that an examination is sufficient to establish a diagnosis; this I doubt, (see case IV.); it cannot even be distinguished from hydatids of the uterus by this sign. When we remember the influence of the ovaria in exciting abnormal developement of other structures connected with them, as the larynx, mammæ, and thyroid body, (43, 61, 67,) the changes which they undergo often resembling those consequent on pregnancy, we may hypothetically infer, that similar changes may incur in an appendage having so close a connexion with the ovaria as the uterus, and thus a hypertrophy of that viscus may be produced, giving rise to all the phenomena of pregnancy, and originating in ovarian irritation. It is also possible, that the ovaria themselves may be hypertrophied. Whatever may be the nature of this enlargement, its possible occurrence should be borne in mind by the practitioner, as it might lead him to form an erroneous opinion. In the only case of the kind which has come under my observation, I was thus deceived; but Hatin says the most skilful accoucheurs have been deceived more than once.[m]

CASE IV.—A married woman, aged about twenty-eight, of hysterical appearance, consulted me for a globular enlargement of the abdomen, which presented a firm resistent tumour, the size of the sixth or seventh month of pregnancy. The cervix uteri was shortened. The areolæ were developed, and milk flowed from the nipples. The patient complained of distressing flatulence, borborygmi, globus hystericus, and many other hysteric symptoms. She asserted she felt something alive in her, the motions of which she described; not omitting the fact that it bit her occasionally, and brought on a fit of hysterics. She was firmly of opinion that it was a snake which she had swallowed somehow or other. I concluded that she was pregnant, and the other symptoms were dependent upon the pregnant state; but I soon found, upon inquiry of her neighbours, that my opinion was not thought of much value, for she was a well-known character, was very lascivious, to a degree, indeed, amounting to nymphomania, and had suffered from the same symptoms for nearly a year. I never saw her again.

The diagnosis in such a case is exceedingly difficult, and

[1] XV. ii., p. 562. [m] CXXV. p. 449.

is best based upon the general history and habits of the patient, which should be cautiously inquired into, especially when the apparent pregnancy is accompanied by decided hysterical symptoms, as in the case just related.

SECTION II.

THE KIDNEYS.

a. Alterations in the Quantity or Composition of the Urine.

The uterus itself is scarcely more subject to disease in hysteria than are the kidneys. The most common forms of disordered action are increased or diminished secretion; but frequently the composition of the urine itself is altered.

The composition of the urine of hysterical patients varies according to the form of the disease. That of the common paroxysm is well known to be aqueous, with little urea.[n] In chronic, or aggravated hysteria with paralytic and other affections of the nervous system, the urine frequently resembles that of paraplegic patients, being alkaline, and depositing the triple phosphate in abundance,—a condition of the urine observed in persons exhausted by excessive study, bad diet, and other depressing agencies.[o] This alkalinity of the urine is frequently accompanied by a mucous deposit derived from the bladder, which stops up the catheter. The mucous membrane of the bladder is also considered to impart alkaline qualities to the renal secretion; and Dr. Prout remarks that the opinion that the phosphate of lime contained in the urine is furnished by the bladder, is by no means novel;[p] it is usually combined with carbonate of soda and the ropy mucus secreted by the mucous membrane. Mr. T. B. Curling thinks the alkaline urine in paraplegic patients and others is caused, primarily by the morbid secretions of the bladder, and secondarily by the altered secretions of the kidneys themselves.[q]

[n] Golding and Brett, in XIV. xii., p. 387.
[o] XCIV. p. 162.
[p] XCV. p. 155.
[q] XIV. xviii., p. 325.

The formation of urinary calculi and sand has been observed in some cases, and the rare black deposit has also been noticed. It is to be regretted that more information respecting the chemical composition of these urinary products has not been obtained.

Sugar, blood, and albumen have also entered into the composition of the urine of hysterical patients. Dr. Montgomery quotes a case from Ossan's Clinical Report for 1823, of a young woman who in three successive pregnancies was affected with diabetes mellitus. It completely ceased on delivery, but always recurred when she conceived. Macculloch relates the history of a man who had an intermittent diabetes mellitus recurring with the most perfect regularity, and accompanied by a complete hysterical paroxysm.[r] Hæmaturia and albuminous urine are not at all uncommon in hysteria: the former frequently occurs in the hæmorrhagic form of the disease, and is occasionally a complication of pregnancy; the latter is probably analogous to the peculiar urine of pregnant females, noticed by Dr. Montgomery, and described by other writers as milky.[s]

Excessive flow of urine (*diabetes insipidus*) is precisely analogous to the profuse sweats and salivation observed in hysteria. It usually terminates the common hysteric paroxysm, but is not unfrequent as a chronic, and occasionally an intermittent, disease.[t] It will happen as a transitory consequence of mental emotion in delicate females.

The slight attacks of hysterical ischuria, so common in nervous affections, especially at the catamenial periods, are frequently overlooked by the practitioner, or concealed from him. A young woman will suffer for twenty-four or thirty-six hours a suppression of urine, and if the hand be placed upon the hypogastrium, no distension of the bladder will be observed. She is perhaps alarmed at the occurrence of this long interval, the pulse will be found much quickened, but nothing otherwise remarkable will be noticed. At last the patient voids a few table-spoonfuls of urine, and nothing more is heard of the suppression.

[r] XCVI. ii., p. 95. [s] XCI. p. 157.
[t] Casper's Wochensch. No. xxix., 1839.

b. Ischuria with Paruria Erratica.

Occasionally renal ischuria forms the most prominent symptom in a case of aggravated hysteria; the urinary secretion being entirely suppressed for days, and accompanied by paraplegia; and in some cases by the formation of sand and gravel, and apparently an erratic secretion of urine. The following will perhaps be read with interest, as exhibiting some of the points adverted to in the preceding paragraphs.

CASE V.—*Hysteric Hæmorrhage; Ischuria; Urinous Vomiting; Tympanites; Loathing of Animal Food.*

Ann Cosgrove, aged thirteen years, was admitted into the York County Hospital on the 2nd of March, 1837, complaining of a frequent sanguineous discharge from the vagina, debility, and pain in the back and abdomen. The latter was enlarged, tense, and tympanitic. She was somewhat diminutive, had dark eyes, a complexion resembling that of a Hindo-Briton, and a dark tint round the navel. The mammæ were of the usual size, the areolæ of a brown black colour, and studded with prominent papillæ.

The mother of the patient stated that in June 1835, her body began to swell, and became painful, and she had pain and difficulty in passing urine, which was in small quantity, and very red, as if mixed with blood. She also spit up a yellowish-red fluid, and had a teasing cough. In August or September following, she had the first appearance of the menses. Her abdomen at that time was very painful, frequently swelling to a great size, and then subsiding; and the bowels were exceedingly constipated. The sanguineous urine and expectoration also continued. She was more or less indisposed with these symptoms during the winter and spring following, frequently complaining of pain in her back, and when passing her urine, which was scanty.

During the first menstruation just mentioned, (about the 20th of August,) she could not pass urine, and was in great pain. The next day, however, she was able to void a few table-spoonfuls of a red colour. At this time, to use the mother's expression, "a nauseous salt water of a red colour, and clear, used to come into her mouth." After this time the menses seemed to return too frequently, as she had a sanguineous discharge two or three times a week. Her appetite was always delicate; broth constantly made her sick and vomit; she could take small quantities of animal food, but "when the red water came up, the smallest portion made her very sick." She usually took no breakfast, and very little dinner.

After her admission into the hospital she took active purgatives and acids, had leeches to the abdomen, &c., and was discharged relieved; but the tympanites soon returned, for when a pupil saw her subsequently, her

abdomen was so large that she appeared to be in the last month of pregnancy.

On April 27, following, she was re-admitted, complaining of all her old symptoms. The assafœtida mixture relieved the tension of the abdomen; but in a few days she complained of pain in the hypogastrium, and inability to pass urine, and the tympanitic distension returned. After the suppression of urine had continued thirty hours, the bowels became constipated; and as the hypogastric pain was exceedingly urgent, I introduced the catheter, and five or six ounces of urine flowed. During the forty-eight hours following she voided only a few table-spoonfuls.

Under these circumstances, six drachms of spirit of turpentine were given in the form of draught. Vomiting was excited, and she had one dark, ill-formed motion, and these were followed by diminished swelling and tension of the abdomen, but the urine continued scanty. About this time she began to vomit a "saltish" water, and I directed that she should remain in bed. I find the following notes respecting this circumstance in my case-book:—

"May 6th.—She has vomited four ounces of a fluid having a dull-red colour, and a violet odour like that observed in the urine of a person who has taken spirit of turpentine. The patient occupying the adjoining bed, a well-conducted female, saw her vomit. Heated in an iron spoon, it smells disgustingly strong of urea, and coagulates. The abdomen is as large as ever, tympanitic and tender on pressure; and she has the usual red discharge.

"May 7th.—Has vomited a mouthful or two of a fluid like that vomited yesterday, which she asserts is not urine.

"May 8th.—Vomited two ounces of fluid, similar in all respects to the last, in the presence of the nurse. Heated in an iron spoon it smells disgustingly strong of urea.

"May 9th.—Has not vomited the urinous fluid, but one which she says tastes bitter: also, that shortly after leaving the hospital her body began to swell, and she vomited a red fluid like that which came up yesterday."

From this period she recovered rapidly under the use of decoction of aloes, bitter infusions, and assafœtida mixture.

There was no doubt that this patient vomited a urinous fluid; and the only questions were, whether she had swallowed it, or whether it was secreted by the stomach or salivary glands. She had communication with a hysterical impostor in another ward, who feigned urinous vomiting; hence a well-grounded suspicion that she had practised a similar deception. On the other hand it ought to be stated that she strenuously denied that the fluid she vomited was urinous. She was very anxious to leave the hospital and return to her employment, in which she took great pleasure. She was a

teacher in a school for poor children attached to the Convent in York, (being a Roman Catholic,) and was in favour with her employers. Her spiritual adviser considered her a girl of good conduct and character.

Amongst the cases recorded of hysteric ischuria with paruria erratica, it is difficult to select one sufficiently brief, yet unexceptionable in it details. The authenticity of the following has, I believe, never been doubted. It is on the authority of Dr. Girdlestone.[u]

CASE VI.—*Aggravated Hysteria; Paraplegia; Urinous Vomiting; Loathing of Animal Food.*

A young lady, the daughter of a respectable army surgeon, was under the care of her father and a physician for two years. The death of her brother by drowning had conspired with other events to induce syncope and a variety of nervous symptoms, which had resisted all the mineral tonic and nervous medicines commonly prescribed in such cases. Being sent to Yarmouth, she came under the care of Dr. Girdlestone. She was about twenty years of age, fair, and not unhealthy in her complexion; and though she was pale, yet she had more the appearance of a muscular, than of a fat person. She had no use of her lower extremities, nor could she lie down without inducing fits of hiccough or vomiting. Animal food or any liquid excited vomiting so soon as it entered the stomach; so that during the greater part of the two years she resided at Yarmouth, she was obliged to live entirely on fruit, and to sleep in an erect posture in a chair. The liquid she vomited proved to be urinous, and, on standing for a time, had the healthy nebula of common urine. She usually vomited about six or eight ounces at a time, with intervals of about six or eight hours; and if animal food had not been taken to hasten its rejection, it was unmixed with food. She had ceased to pass urine from the bladder for above two years. Her motions were invariably found to take the shape of a distended rectum, and to have come away without a single drop of urine; and in the presence of Dr. Girdlestone and Mr. Borratt, the catheter was introduced by Mr. Downe, and the bladder was found not only empty, but so contracted, as to lead to the belief that no urine had entered the bladder for some time. Dr. Girdlestone adds, that every medical man in the place (Yarmouth) at that time, was made to bear witness to the case. After having ascertained by repeated trials her ability to swallow and retain pills which contained no animal food, Dr. Girdlestone had some beef pounded into pills, some of which the patient swallowed in the presence of himself and Mr. Borratt. In twenty minutes she began to express her doubts of being able to retain her pills, as she was feeling the same sensations as if she

[u] L. xxxi., p. 111.

had animal food in her stomach. The pills, deprived of the gum tragacanth which surrounded them, soon came up, with a considerable quantity of urine. Having continued at Yarmouth during two years with these symptoms, she left, and died a few weeks afterwards. An examination of the corpse could not be obtained.

In the preceding cases an erratic discharge of urine seems to have been consequent upon the renal paralysis. The existence of this symptom (termed *paruria erratica* by Good) has been strenuously denied, on the grounds of its supposed impossibility, all the recorded instances being considered cases of deception. The general question possesses rather a physiological than a pathological importance; but it certainly has a degree of value in its relations to some phenomena in gout, and in its bearing upon a humoral pathology.

I may be permitted, perhaps, to state shortly the grounds upon which I gave my assent to a belief in the possibility of the occurrence of this symptom. Two cases came under my own notice in the York County Hospital, in which it was stated to have occurred;—case v. is one of these, the other is related at length elsewhere.[v] Being anxious to settle the question in my own mind, I commenced a close observation of these, reading, at the same time, all the analogous instances related by authors, and the opinions which had been stated by physiologists. I found twenty-five cases of hysterical affection[w] in which this symptom had occurred, or was supposed to have occurred; some of them doubtful, but others bearing every mark of authenticity, as those related by König, Senter, Cheyne, Girdlestone, Arnold, Hastings, Coley, and Crampton. In addition to these instances of erratic urinary secretion in women, I found others which had occurred in cases of paraplegia, or in the renal ischuria of gouty patients.

The result of my researches will be best given in a tabular form, as follows:—

Vomit.	Stool.	Ears.	Eyes.	Saliva.	Nose.	Mammæ.	Navel.	Skin.	Total.
34	20	4	4	5	3	4	34	17	125

Cases are omitted under the head "Stool" in which there was a known communication between the rectum and bladder; in

[v] VII. xlix., p. 78. [w] The details are in VII. Tom. cit.

two of the number given, it was ascertained that no such communication existed.[x] The number in which the discharge took place from the umbilicus is not very precise; but if we suppose that, in the whole of the instances under the heads of "Stool" and "Navel," there was a direct communication with the bladder, ureters, or kidneys, we have still seventy-one instances to account for;—were they all feigned? Upon referring to physiological writers for a solution of the question, I found that such men as Haller, Alison, Good, and Elliotson had virtually come to the conclusion that they were not, or, in other words, that urine had been secreted by other organs than the kidneys.

Although in the cases which came under my own notice, I failed in substantiating the fact, in spite of a watch of one of them, carried on personally both night and day, yet I could not but yield assent to the united force of the other cases I had accumulated, and the opinions I had obtained thereon; and I next felt anxious to ascertain how so remarkable a phenomenon could be explained. Turning to the lectures of Dr. Grant, (of whose class I had the great honour and pleasure to be a member,) I was not long in discovering that the laws of embryological developement, not less than of transcendental physiology, with regard to the structure and functions of mucous membranes, fully sanctioned and corroborated the facts and opinions stated above; and on referring to the recorded facts in natural history and pathology, respecting the mutual interchange of products by mucous membranes, so much additional testimony was obtained as completed the chain of evidence. Thus, hair grows on the mucous membrane of the mouths of hares, and on that of the stomach of cuckoos, and horses;[y] Dr. Christison found cholesterine in the cyst of a diseased kidney;[z] Dr. Sims relates the case of a literary gentleman who passed ammoniaco-magnesian phosphate by stool;[a] and an oxalate-of-lime calculus has been found in the jejunum.[b]

Müller denies the correctness of the opinion maintained by

[x] Morgagni, Epist. xiii., § 46.
[y] CXXXVII. Bd. xxi., p. 385.
[z] VII. xxxii., p. 262.
[a] VII. xliv., p. 119.
[b] L. xxxii., p. 80.

Haller and others, namely, that *all* secretions may, under the influence of disease, be formed by each and every secreting organ. "The *excretions*, those matters which exist ready formed in the blood, and of which urea is an example, can alone, after the destruction of the excreting organs, be eliminated from the vessels in all parts of the body by the process of exudation."[c] If this be a correct statement of the general fact, the erratic urea would necessarily permeate the muscles and cellular tissue; no such case, however, is recorded.

Now, in opposition to these somewhat limited views of Müller, the following extracts from Dr. Carpenter's valuable work may be placed; which, although of great value as coming from him, are of greater as being the general expression appertaining to a vast number of facts in natural history. The laws of developement may assist us in understanding these erratic secretions; thus one law, concisely stated by Von Baer, is this: "A heterogeneous or special structure arises out of one more homogenous or general, and this by a gradual change." This law, Dr. Carpenter remarks,[d] applies to function as well as structure; and observation of function leads to another law, namely, "in cases where the different functions are highly specialized, the general structure retains more or less the primitive community of function, which originally characterized it." Dr. Carpenter adds, "that as all glands have the same elementary structure, and differ only in the peculiar adaptation of each to separate a particular constituent of the blood, it is a necessary result of the law just stated, that either the general surface of the skin, or some of the special secreting organs, should be able to take on in some degree the function of any gland whose duty is suspended; and observation and experiment fully bear out this result."[e] Dr. Carpenter subsequently mentions instances of erratic secretion, and remarks, "Such cases have been considered as fabulous, but the physiologist can now readily comprehend them."[f] This law stated by Carpenter is also applicable to vegetables; De Candolle laying down the axiom in vegetable physiology, that when a particular function cannot, according to a given system of structure, be sufficiently carried into effect by the organ

[c] XIII. p. 431. [d] LXVI. § 201. [e] Ibid. § 207. [f] Ibid. § 471.

which is appropriated to it, it is performed wholly or in part by another."[g]

With regard to the mode by which one organ pours out the secretions of another; I have already shown that an influence is propagated along the nerves of voluntary motion, by which certain changes in the blood are induced, and the force necessary for muscular contraction elicited; now the changes caused in the blood by the secreting nerves, are equally dependent upon an influence derived from the nervous centres, as has been proved by numerous experiments, as well as pathological observations; the class of diseases we are treating of being an instance of the latter. Dr. Carpenter brings forward various facts to prove "that what has been termed the selecting power of absorbent surfaces, by which they take up some fluids and reject others, is not due so much to their peculiar vital properties, as to the physical relations between their tissues and the substances brought into contact with them.[h] Hence, if, as is probable, any change in the molecular structure of the secreting nerves as they lie in the spinal cord, be sufficient to alter their relations to the blood as it circulates through the organ to which they are distributed, a new excretion may be selected from it, and thus a gland hitherto secreting gastric juice may excrete urea. It is on these principles that we can explain the secretion of sugar by the kidneys in diabetes, in which the secreting nerves of the spinal cord are certainly affected, because the patient is usually impotent. It requires no great stretch of imagination to conceive how the gastric nerves may take on this new action, when we consider the intimate connexion between the solar plexus and the renal nerves.

I have presented the preceding remarks to the reader with the hope of rebutting the charge of credulousness in such matters, and to show that I have not trusted solely to observation. The opinion that erratic secretion of urine is impossible, as asserted by some; or that the fiat of the Creator has immutably established that the kidneys alone shall secrete urine, as a recent writer asserts, I shall leave to be estimated

[g] Op. cit. § 253. [h] Ibid. § 245, 250.

at their proper value. To argue against them would be absurd; they can only be met by a direct negative, or by ridicule.

This symptom is unquestionably rare, but may take place oftener than it is observed. Should it occur to the practitioner, he will doubtless find a medium course the best; namely, to remember that he may be deceived by his hysterical patient, but also that the symptom may be real. He will thus be led to observe cautiously and accurately, which is all that is wanted.

It is curious to observe that, like diabetes and other profluvia, paruria erratica may be periodic;—it was tertian in a case related by Mr. Coley;[i]—and that precisely the same organs are affected as in gouty deposits (262) and in vicarious or hysteric hæmorrhages; with the latter, indeed, it has been frequently co-existent.

Diagnosis, Prognosis, and Treatment of Hysterical Diseases of the Kidneys.

In establishing the above indications, it is clearly of importance to ascertain the composition of the renal secretion. An increased quantity need create little alarm, unless it contain sugar; and even in that case, if the patient be young, the affection will probably be found periodic, depending solely upon functional derangement of the nervous system, and yielding readily to quinine and nervine alteratives, with diuretics.

When the quantity is diminished, or the urine alkaline, there will be more or less disorder of the nervous system, from slight pains and numbness in the thighs, &c., to actual hemiplegia or paraplegia; and the prognosis and treatment will vary accordingly. When the lithic acid deposit is present, there is a state of the system analogous to the gouty, and the anomalous affections of other organs which usually accompany it. The cases of Arnold, Senter, and König[k] are illustrative instances. It is in cases of this kind in which colchicum and long continuance in the warm bath every day (328) will be of the greatest service, combined with suitable general treatment. One of these came under my notice lately, characterized by nervous-

[i] L. xxx., p. 465. [k] VII. xlix., pp. 94, 96, 99.

ness, flying pains, occasional dyspnœa and palpitation, neuralgia of the scalp and sternum, diminished urinary secretion, and the red sand deposit. Due attention to dietetics, exercise in the open air, and early hours, were recommended in conjunction with the pill mentioned in Part II., paragraph 328. An aperient draught was premised, as the bowels were obstinately constipated, and a plaster made with ammoniacum and mercurial plaster applied to the loins. In a few days I had the satisfaction to observe a marked improvement in my patient.

Dr. Copland notices those cases of hysteria with the uric acid deposit, and recommends in such the use of the fixed alkalies and alkaline subcarbonates; it is not improbable that their efficacy would be increased by very small doses of colchicum or black hellebore. In those cases of neuralgia which yield to the terebinthinate diuretics and purgatives, colchicum might also be found of use, but more particularly if there were a diminished quantity of uric acid or urea secreted. Should the urine be alkaline, and the practitioner, upon inquiry, discover some branches of the family connexions of the patient to exhibit the gouty diathesis, it will be useful to try the preceding plan, for the urine is alkaline in the gouty paroxysm itself. If neuralgic pains accompany the ischuria, the same treatment may be adopted as that recommended for neuralgia of the uterus; and in the more severe forms of functional paraplegia, a ligature of the legs, sufficiently tight to arrest the circulation, or dry cupping of the thighs, with the administration of cantharides, turpentine, or the alkalies, might be tried. All, however, will avail little without air and exercise. The practitioner should be on his guard respecting the formation of calculi. In that form of insanity termed "hysterical imposition" or "cunning," as in others, the patient directs her attention most to the organs which suffer most; hence the instances of young and respectable females dropping pebbles or gravel into the chamber-pot, to make their friends and medical attendant believe that their symptoms are dependent upon stone in the bladder. The histories of feigned urinous and fæcal vomiting are of a similar nature.

SECTION III.

THE BLADDER.

The disordered functions of the dorso-lumbar portion of the spinal cord are obvious in the altered functions of all the viscera connected with it, but more particularly in the vesical paralysis which attends upon most cases of aggravated hysteria.

Although there be only functional disease of the spinal cord, and that only, in many cases, during the menstrual periods, the symptoms for the time strongly resemble those dependent on organic disease. The bladder, in the severe cases, is not merely paralysed, but its mucous membrane also secretes alkaline salt, with phosphate of lime (see last section, *a*). The practitioner should remember, that when vesical paralysis is present, unaccompanied by renal ischuria, tympanites, constipation, or nervous symptoms referred to the lower extremities, the probability is, that the disease is feigned. It is well known that women with depraved feelings have a great pleasure in undergoing the operation of catheterism.

Treatment of Vesical Paralysis.—The action of the *secale cornutum* upon the contractile power of the uterus, so well known, might readily lead to the inference that it would excite the bladder to contract upon its contents. Dr. Allier, junior, has accordingly found it highly efficacious in several cases of retention of urine.[1] A scruple of the powder may be given in six doses, at intervals of four hours, and the quantity be gradually increased, until it is doubled. Colchicum and helleborus niger would perhaps be equally beneficial, especially the latter. I have found that vesical paralysis is best removed by lytta, a grain of which may be given in the form of pill, once or twice a day; it has relieved this symptom when the catheter has been used for many months. The application of a lytta plaster to the loins for an hour or two is of great benefit, and a mode of using the remedy much to be preferred, as its action can be more readily controlled, and there is less danger of injuriously stimulating the ovaria and uterus. Cases in

[1] Journal des Connaiss. Med. Chir., Nov., 1838.

which the lytta is contra-indicated, the above-mentioned remedies, or strychnia, may be administered—a medicine highly useful in paralysis of the sphincter of the bladder. Turpentine enemata and liniments, stimulating diuretics, and cold pediluvia, have also been found beneficial. All these remedies will act better when combined with small doses of opium, or with tonics. Should all means fail, it is nevertheless proper to defer catheterism as long as is consistent with the safety of the patient, for the operation, by exciting the sexual feelings, may aggravate the general disease. So little urine is secreted in many cases, that three or even five days may be allowed to elapse; in all cases, the degree of distension of the bladder being the guide. When there is incontinence of urine, it is of importance to attend to this, as it may be dependent on paralysis from over distension.

Treatment of Irritable Bladder.—Irritable bladder arises from the same causes as irritable uterus, and must be treated in the same manner. Of all medicines, a combination of camphor and hyoscyamus has been found most useful; lactucarium, with diuretics, has also relieved.

SECTION IV.

THE INTESTINES.

The symptoms implicating these viscera vary according to the viscus affected, and the degree of disease; in all, the sensibility of the secreting surfaces may be so increased that neuralgia or a profluvium be developed; or paralysed, so that secretion be suspended, or the movements of the muscular fibres arrested or weakened, and colic, diarrhœa, tympanites, or constipation supervene; and these may be periodic or otherwise; subject, indeed, to all the agencies by which the general disease is modified.

a. Intestinal Profluvia.

Diarrhœa.—Diarrhœa is much more frequently attendant upon a delicate state of health than upon the severer forms of

nervous affection, in which the secreting, as well as motor structures of the intestines, are paralysed. It is mentioned by Sydenham, Whytt, Pomme, and others, as a symptom of hysteria, and of atonic gout, and being one much more obvious than constipation, its periodic recurrence has been oftener observed. The complications of hysterical diarrhœa are numerous, but need not be enumerated, as they will be well known to the practitioner.

Treatment of Diarrhœa.—The best remedies are the mild astringents; according to Dr. Billing, the hæmatoxylum is to be preferred, as well in hysteric as in gouty diarrhœa. Small doses of hydrargyrum cum creta, rhubarb, and ipecacuan, frequently repeated; the chalk mixture, with aromatic confection, and even antispasmodics,—as assafœtida, camphor, musk, Hoffmann's anodyne, and the compound tincture of ammonia, —have been found useful, especially when colicky pains accompany the purging. Plaster of assafœtida, galbanum, and other stimulants, have been applied to the abdomen with benefit. The tone of the system at large should be increased if possible.

Tympanites, Borborygmi, Œdopsophia.—The excretion of gas from the intestinal mucous membrane is now generally recognised to be a natural process, and it is the accumulation or rapid formation of this gas which constitutes the disease termed tympanites. Some of the older writers attribute the non-expulsion of the gas to paralysis of the muscular fibres of the colon,—an explanation I am much disposed to adopt, as it is quite in accordance with the general doctrines advocated. This paralysis may either happen directly from deficient innervation, or originate from over-distension, when the gas is rapidly poured out as a profluvium. The accumulation is occasionally so great as to give the patient the appearance of advanced pregnancy. (Case v.)

Mediate auscultation of the abdomen, and the sounds elicited when the intestines of the dead body are compressed by the hand, very satisfactorily show the origin of the borborygmi so common in hysteria and hysterical females; and which are sometimes so loud as to be exceedingly annoying when the patient is in society. The sounds originate in the

peristaltic movements of the intestines, acting upon flatus confined either by spasmodic constriction of the bowel or arrested fæces.

Hysteric females suffer more from tympanitic distension of the stomach and colon than of any other part of the alimentary canal. The flatus unquestionably originates, in many cases of paroxysmal hysteria, in the cæcum and colon. It can be traced by the patient, and occasionally by the spectator, appearing through the parietes of the abdomen like a ball, as it ascends from the pelvis, distending successively each portion of the tube, and probably mounting to the œsophagus, where, being arrested by the spasmodic closure of the pharynx, it may cause, in some cases, the sensation well known as the globus hystericus.

The mucous membrane of the stomach is endowed with the power of secreting gas; for in some cases of hysteria it is enormously distended with flatus: the same symptom, in a less degree, is observed in paroxysmal diseases of the thoracic viscera, as angina pectoris, asthma, &c. In hypochondriac and nervous patients in general, even the mere act of taking food will excite flatulent distension of the stomach, and slight spasmodic action (hiccup).

There are some rare cases, in which flatus is passed by the urethra and vagina, and which have been described under the term Œdopsophia. Sauvages[m] quotes instances from Zacutus, Hoffmann, and Freind, of gas passing from the urethra of men who had disease of the bladder, or simply from coitus. Astruc and other writers mention uterine tympanites; in these cases large and noisy discharges of flatus from the uterus take place many times a day.[n]

There can be no question that air may be excreted from any mucous surface, but its composition is as various as the organs from which it is evolved. It is well known that the skin and lungs secrete carbonic acid gas, and that odorous substances, taken into the circulation, will pass off by both these surfaces. It does not appear that the fæcal odour is derived from the gaseous products, but rather from a fluid

[m] XI. ii., p. 417. [n] Gooch, CXXIII. p. 242.

secretion analogous to that found in the tonsils. However this may be, Magendie and Chevreul met with only a trace of sulphuretted hydrogen gas in the gases found in the colon of two executed criminals; they principally consisted of carbonic acid and nitrogen gas, with varying small proportions of hydrogen and carburetted hydrogen.[o] Dr. Osborne had a case of hysteria, with constipation and tympanites, in which he introduced an elastic tube into the rectum, and pumped the gas from the distended colon; it was inodorous, and extinguished flame,[p] precisely the qualities which the mixture of gases analyzed by Magendie and Chevreul would possess. In Dr. Evans' case already referred to, in which there was an enormous extrication of gas, its composition was similar, containing 50 per cent. of nitrogen. (269.)

Treatment of Tympanites.—Since this affection depends either upon irritation or paralysis, it is obvious, theoretically, that the drastic purgatives will be injurious, and such, in fact, is the opinion of the most practical writers; yet there are practitioners who use these to a considerable extent. There are two indications in the treatment of tympanites: the one, to procure the evacuation of the gas; the other, to prevent its formation and accumulation. To fulfil the first, Hippocrates recommended the imbibition of ice-cold water, and its application externally; and Pomme, after Zacutus and Cambaluzier, adopts the same mode of treatment, on the principle of diminishing the volume of the gas, by lowering its temperature; it is more probable that, since the colon is in a state resembling that of the bladder in paralysis from over-distension, the cold acts more by giving tone to the muscular fibre. A species of catheterism is, however, the most effectual remedy. Dr. Kerr, in his Essay on Tympanites,[q] states that Trnka, who published in 1788, recommended the abstraction of the gas by means of the air-pump; but, according to Sauvages,[r] to Amatus the merit is due of having first introduced the use of the syringe. Dr. Osborne, more recently, has adopted the practice, and Dr. Graves has confirmed its utility.[s] If, however, the method of evacuating the gas practised by

[o] CXVII. p. 268. [p] XIV. viii., p. 825. [q] XV. iv., p. 357.
[r] XI. ii., p. 416. [s] Kerr, in Op. cit.

Dr. O'Beirne in cases of strangulated hernia (and by which he has succeeded in effecting reduction of the bowel when the ordinary taxis failed) be adopted, the syringe will often be unnecessary. Dr. O'Beirne recommends that the elastic tube, which is of a peculiar construction and considerable length, be thrown into cold water until it be stiff, then made perfectly straight, and its end well oiled. The patient being placed on his left side, it is then to be introduced inch by inch, and if obstructed, an enema is to be thrown up, by which means the spasm will be relaxed, or the impeding fæces evacuated.[t] For the less urgent cases, the well-known carminatives, particularly from the umbelliferæ, may be given; the confection of rue has been found highly serviceable. Whytt recommends assafœtida, castor, laudanum, and æther; the use of the flesh-brush to the legs, and carminative liniments to the abdomen.[u] The too rapid formation of gas can only be prevented by treatment calculated to diminish morbid sensibility.

Treatment of Œdopsophia.—Ergot of rye, or colchicum, might be serviceable in these cases, in combination with the alkaline or metallic tonics, and with external stimulant applications.

b. Intestinal Paralysis.

Constipation.—It is surprising how long a period delicate women will occasionally allow to elapse between each evacuation of the bowels; from five to ten days is by no means an unusual time, and sometimes as many weeks have intervened. The constipation of hysterical females depends partly upon paralysis of the intestine, and partly upon diminished secretion from the mucous surfaces: unless there be a local cause, it is always proportionate to the severity of the general disease, and accompanied by more or less ischuria, tympanites, abdominal and spinal tenderness, &c. It is in the severe cases of hysteria that the most extraordinary constipation has been witnessed; in such, from three to six months, and even seven years, have elapsed without a stool.[v]

[t] XXXV. xiv., p. 125. [u] XCVIII. p. 699. [v] VI. p. 125.

Treatment of Constipation.—The indications are the same as in tympanites; the drastic purgatives are equally to be avoided. The best remedy is improvement of the general health; but, as palliatives are necessary, some of these may be enumerated. Both internal and external remedies are available, but the latter are particularly to be preferred, because more under our immediate control. The ancients used purgative epithems very extensively, formulæ for which may be found in Ætius; their active ingredients were colocynth, scammony, aloes, &c. Simple friction of the abdomen will be sometimes useful, or better still with terebinthinate liniments, or weak croton oil mixtures. Enemata, or suppositories (of soap) daily, and, if there be tympanites, the introduction of the long tube might be tried: patients, however, will be always more willing to take medicine, as being least troublesome; and suitable formulæ abound. The indication is obviously to stimulate, and, at the same time, increase the tone of both the mucous and muscular coats of the intestines; for unless we bring up the sensibility of the mucous surface to par, the most energetic purgatives may be given in vain. Very small doses of elaterium or colocynth in combination with opium, camphor, or the metallic tonics, especially nitrate of silver, will always act more quickly than large doses uncombined. Two grains of camphor, half a grain of quinine, and two of colocynth pill, repeated at intervals of two or three hours, act mildly and effectually. There is seldom, however, any urgent necessity for immediate action of the bowels in cases of hysteria; a motion every other day is sufficient, so that aperients may be combined with suitable general remedies. When there is the arthritic diathesis, one of the compound colchicum pills mentioned paragraph 328, will act readily on the bowels, after they have been taken a week, and with great benefit to the general health; or if not sufficiently active, one may be taken at night, and a tea-spoonful of Epsom salts, in a tumbler of warm water, early in the morning. In some patients, the latter, with the addition of two grains of the sulphate of iron, is both mild and efficacious. Mr. Parker recommends small doses of blue pill and rhubarb (or aloes), with compound galbanum pill, and the extracts of hops, let-

tuce, or hyoscyamus. When the compound iron mixture is given, it may be very conveniently combined with the compound decoction of aloes. Numerous other formulæ might be mentioned, but so many are well known to the practitioner, that it is unnecessary.

c. Intestinal Neuralgia.

Hysteric Colic.—Colic is a well-known and very distressing affection of hysterical persons, and, in the majority of cases, arises from confined flatus, distending parts of the colon in a state of spasmodic stricture; it is a pain which, according to the quaint Flemyng, who wrote a poem on Hysteria and Hypochondriasis,

> "Vero longè dirissimus occupat omnem
> Inflexi tortum coli, rem nomine monstrat."
>
> *Neuropathia*, p. 41.

It may be doubted, however, whether the pain be invariably seated in this portion of the intestinal canal. I have witnessed a very severe attack, without any obvious flatulent distension; and the latter to an enormous extent, without causing any colicky pains whatever. It may originate, in some cases, in the cystic or common bile duct, or in a portion of the small intestine spasmodically constricted and irritated by the pressure of fæcal matter.

Hysteric colic is more usually accompanied by constipation than by diarrhœa. There is frequently great tenderness of the surface of the abdomen, and other neuralgic and spasmodic affections; it is by these that it may be distinguished from abdominal inflammation, and also by this—that there is not that sudden and excessive prostration, and its accompanying characteristics, so invariably marking peritonitis, or enteritis ending in peritonitis. The expression of the countenance in visceral inflammation is anxious, pallid, and sunken; while in hysteria the face is flushed, often plump, and the eyes have a peculiar expression of uncertainty and indecision; in the one the pulse is quick, hard, and small, but regular in rhythm; in the other it is wavy, thrilling, and irregular in rhythm, the slightest emotion or effort altering its frequency; but when true inflammation sets in, these characteristics dis-

appear. These signs will also serve to distinguish abdominal tenderness from inflammation, when there is no colicky pain; but it may be added, that the hysteric patient flinches almost before she is touched, and pushes the hand from the abdomen in a very impatient manner. When colic originates from organic disease, as scirrhus, the appearance of the patient, and the history of the symptoms, will amply suffice for establishing a correct diagnosis.

Treatment of Hysteric Colic.—When there can be no doubt of the nature of the affection, the same treatment may be adopted as recommended for tympanites. A towel wet with cold water, and applied to the whole abdomen, and frequently renewed, ice-pills, cold drinks, and cold clysters, will often successfully diminish the morbid sensibility. Amatus, Zacutus, Septal, Hoffmann, Pomme, and others, have adopted and recommended this mode of treatment; but it ought to be remembered, that if there be organic disease, it may induce fatal peritoneal inflammation. The usual antispasmodics and sedatives may be administered internally; but, in general, they are far less useful in hysteric colic than in other forms of the disease. I know by my own observation, that opium may be taken to a great extent, with no other effect than (apparently) aggravating the pain. Quinine, valerian, and ammonia, are severally recommended; stimulating liniments to the abdomen, with terebinthinate and assafœtida injections, are more efficacious. Alexander Trallian recommends dry cupping of the abdomen.[w]

[w] De Cholerâ, lib. vii., cap. xiv.

CHAPTER III.

SYMPTOMS AFFECTING THE LIVER, SPLEEN, AND PANCREAS.

It is obvious that these organs cannot escape the interruption of function to which all other organs are liable in hysteria, although they will escape more frequently than those in more immediate connexion with the ovaria, when the general disease depends upon ovarian irritation. Should the violently-excited passions of anger, grief, and their related feelings, be the exciting causes of the general affection, these viscera will be more particularly affected.

Hysteric Icterus; hysteric Hepatitis; pain in the right hypochondrium.—Sydenham first described hysteric icterus. When there is hepatic paralysis either of the biliary or vascular system, the usual symptoms result. There may be, however, a temporary congestion of the liver, when the organ rapidly increases in size, and as rapidly diminishes; a circumstance it is of importance to remember, or the reputation of the practitioner for professional tact might experience detriment.

The pain experienced by many hysterical females in the right hypochondrium is not easily explained, but it is probable that it depends partly upon congestion of the liver, and partly upon the exalted or morbid sensibility of the abdominal parietes, on which the enlarged viscus presses with a force sufficient to produce the continued aching pain. It is on this principle that Dr. Billing explains the hysteric pain in the left side.[x] It is not improbable that there are occasionally other causes; thus fæcal accumulation in the flexure of the

[x] CXXI. p. 129.

colon might be mentioned as a very possible cause of this pain. The diagnosis of these simulated from the true diseases is obvious.

Treatment of Hysteric Icterus, Hepatitis, and pain in the right Hypochondrium.—Occasionally, purgatives have been found useful in treating these affections; also mercurial alteratives;—antispasmodics, and sedatives;—stimulant enemata, and stimulant embrocations and liniments to the region of the spine and liver. An ointment of equal parts of blue ointment and tartar emetic ointment with camphor, has relieved the pain; but in fact, the only hope of permanent relief will be derived from an accurate discrimination of the causes of the affection.

Pain in the region of the Spleen.—The intimate connexion between the spleen and the colouring matter of the blood, when considered in connexion with the pain in the splenic region experienced by chlorotic females, assumes some importance. So little is certainly known, however, of the true function of this organ, that we can only hypothetically attribute the pain under consideration, to causes somewhat analogous to those which originate pain in the opposite side, that is to say, there may be congestion of the spleen, or a distended pouch-like stomach pressing painfully upon the abdominal parietes, already endowed with morbid sensibility. At all events, the treatment in both is the same.

The Pancreas.—This viscus has been completely overlooked by authors when considering hysterical diseases. When, however, we remember the intimate relation which subsists between the ovaria and salivary glands, I cannot but think some of the symptoms referred to the stomach have their origin in the pancreas. But there are no facts which can be made subservient to an inquiry into the true state of the viscus in hysteria.

CHAPTER IV.

SYMPTOMS OF THE NERVOUS DISEASES OF WOMEN, AFFECTING THE VISCERA, IN CONNEXION WITH THE RESPIRATORY GANGLIA.

SECTION I.

THE ALIMENTARY APPARATUS.

The contents of the epigastric region have always been considered as important organs, (they were "the noble parts" of the ancients,) and this obviously from their connexion with the most important portion of the cerebro-spinal axis. For this reason the exclusive attention given to the state of the stomach by some practitioners is not irrational; but pathology, not less than physiology, (200,) demonstrates the intimate relation existing between the other chylopoietic viscera and the respiratory ganglia, or how else can we explain the vomiting, the extreme depression of the pulse, accompanied or followed by increased quickness, and the hurried respiration consequent upon injury or inflammation of these structures? It is of importance to remember these general facts, lest by attention to nosological arrangement, we overlook the more important causes of morbid action.

The action of the ovaria upon the alimentary apparatus, in common with the other organs supplied with nerves by the respiratory ganglia, has been already demonstrated (64, seq.); so that nothing more is necessary than briefly to review those symptoms of hysteria which implicate the stomach, œsophagus, pharynx, and salivary glands, and their related structures, the tonsils, uvula, and Eustachian tube. Some of these are

occasionally hypertrophied; but with this exception, all the symptoms belong to the class neuroses.

a. The Stomach.

Cardialgia; Gastrodynia; Pyrosis.—The distinct disease termed pyrosis rarely accompanies the more aggravated forms of hysteria, being confined to the earlier stages; but a modified form is observed when adjoining structures are affected, as the heart, liver, diaphragm, or respiratory muscles in general. The distinguishing symptoms, namely, acute pain in the epigastric region, and eructation of thin mucus, are then obscured by the cord-like contraction of the diaphragm, the neuralgia under the left breast, the asthma, palpitation, angina pectoris, and other neuroses of the thoracic viscera; and the pain differs in degrees intermediate between gastrodynia and cardialgia.

Many delicate women, especially those who suffer from habitual dyspnœa, are liable, upon any mental emotion or other nervine alterative, to sudden attacks of cardialgia, or "the spasms," as it is popularly termed. In these instances the stomach is little or not at all affected, at least in those in which there is no flatulent distension or increased mucous secretion, the sensations being rather seated in the diaphragm or heart. The paroxysm is usually preceded by indisposition, and is ushered in, sometimes by the symptoms of an ague fit, sometimes by the precursors of the hysteric paroxysm; there is also incessant yawning, tendency to syncope, and nausea; and at last vomiting comes on, mostly of the half-digested contents of the stomach, and so the paroxysm ends. Sometimes, when these paroxysmal affections have continued through many years, they disappear, and diarrhœa, ischuria, or some other affection of the pelvic viscera is set up.

Flatulent Distension of the Stomach.—Much yet remains to be investigated respecting the nature of the alimentary gases, and the rationale of their excretion. Under the head *Tympanites*, I have already alluded to their composition; and the reader cannot have remarked the very large proportion of nitrogen gas itself present in so large quantities in the renal secretion, without speculating on the remarkable coincidences

it developes. The excretion of flatus is so common a symptom of the slighter, as well as the more severe forms of nervous affection, that it was supposed to be the cause of numerous disorders; and even now, when a nervous patient past middle age inquires the cause of his complaint, he experiences the greatest satisfaction when informed that it is "wind flying about him." This flatulent pathology lingers still in the opinions of those who maintain that the distension of the stomach by flatus is the immediate cause of paroxysms of angina pectoris, asthma, palpitation, &c. Individuals will have angina pectoris in its mildest form, namely, intermittent pulse, sense of uneasiness of the thorax, and flatulent distension of the stomach; and conclude, as the latter is the most prominent symptom, the others are *propter hoc;* but when these symptoms are excited by mental exertion, and the flatulence is trifling, they are then attributed to their right cause, and we have no hesitation in admitting them to be simply co-existent. I need scarcely repeat that any cause which will excite the other profluvia, namely, salivation, diarrhœa, tympanites, menorrhagia, diabetes, &c., will excite the ventricular excretion of gas, and consequently some or all may be co-existent in nervous diseases with this special symptom; and that the symptom itself will accompany every form of hysteria, but especially those in which the thoracic viscera are implicated.

Diagnosis of Spasmodic Affections of the Epigastric Region.—There are only two diseases to which it is necessary to direct attention; of these perforation of the stomach is the most important. This affection is almost peculiar to chlorotic young women, and is indicated by the sudden accession of peritoneal inflammation in the umbilical region. There is, consequently, that shrunken, pallid, anxious countenance, and the feeling of approaching death, which are absent altogether in cardialgia or gastrodynia; the pulse is of unvarying frequency in the one, while it intermits in rhythm in the other. The latter may be traced to some moral cause, the former is the sequel of over-distension of the stomach, of vomiting, or of some manual effort.

The other affection to be noticed is, an insidious disease of the brain, which is frequently indicated by symptoms resem-

bling gastrodynia or cardialgia, and by no others; there may be only one fit, ending fatally, or many. In forming a diagnosis, I should be inclined to rely, first, upon the general history of the disease as regards its predisposing and exciting causes; secondly, upon the absence of the minor symptoms of hysteria; and thirdly, upon the conformation of the patient, for when disease of the brain is present, the complexion is waxwork-like; the brow smooth and shining; the pupil somewhat dilated; the eyes large or expressive at first, afterwards inexpressive and dull; and the whole manner exceedingly dignified and sedate in the earlier stages, even in women of the lowest class.

Hæmatemesis.—In cases of aggravated hysteria, especially those of the hæmorrhagic form, hæmatemesis is by no means an unnatural symptom, and occasionally takes place at hebdomadal or the menstrual periods, in cases of amenorrhœa. In hysteria, it is commonly the accompaniment of extreme anorexia, but more particularly of that remarkable dislike of animal food which I have distinguished as flesh-loathing. The slightest irritant will induce it in most cases; the blood is rarely coagulated or in large quantity; it is sometimes mixed with a puriform mucus, sometimes with a limpid fluid like that discharged in pyrosis,—indeed the symptom might be termed hæmorrhagic pyrosis. Those women most liable to hæmatemesis are in general of an arthritic habit, of considerable embonpoint, and have a florid complexion.

Bulimia. Polydipsia.—These symptoms depend upon the same causes as anorexia, with which *bulimia* frequently alternates. The patient feels an irresistible longing for food and drink,—not of a hurtful quality, that is *pica*,—but for a beef-steak, or a chop, or a welsh-rabbit, with a glass of stout, ale, or porter; and these will be taken with the greatest relish and without any ill effect, even although a few hours previously every kind of eatable was loathed or rejected.

Excessive hunger is a symptom of numerous diseases, and may be excited by poisons, (especially those of reptiles,) passions of the mind, &c. It is among the rarer symptoms of hysteria; the following case will, however, be interesting to the practical reader.

Case VII.—A young lady, of very delicate habit, had been for a length of time suffering at intervals with oppression, constriction of chest, hysterical fits, troublesome palpitations, and spinal tenderness. She sometimes suffered from distressing tooth-ache: when this was relieved there was generally pain and sometimes sickness of stomach, with oppression and palpitation. Much medical treatment had been adopted, with considerable temporary relief to the symptoms; but as, nevertheless, they were apt to recur, she was ordered change of air and sea-bathing. While at the sea-coast she was attacked so severely with the oppression, pain of stomach, &c., that she was directed to apply a blister over the upper dorsal vertebræ, which was to extend as low as the eighth or ninth. An extract from a letter will best explain the results: "The blister rose very well, and discharged freely, but the matter that came from it after the second day grew very thick, and did not flow off as it did before; the sore, too, looked very strangely, but on applying basilicon instead of the white cerate, the appearance became more natural; she complained much, however, of pain in the left side, which prevented her from lying on it, and of insatiable thirst. Some ale was brought to her, which she drank without stopping. She drank a whole bottle of Clonmel ale in a few minutes, besides wine which she asked for repeatedly. She rested tolerably well that night. The next day she seemed weak, and complained much of her sides, particularly the left. She ate very heartily, however, and took two glasses of wine before dinner. At dinner she ate broiled mutton, drank a bottle of ale, and said that nothing but wine and ale would satisfy her. She had an hysterical fit of crying, but soon became calm; and seemed finely that evening, except for the pain in her side, which she said nothing but eating relieved. After tea she went to bed, and asked for an egg and ale for supper; this she got, and asked for another. I thought the blisters discharging so much must have weakened her, and feared to refuse. During that night she got seven glasses of wine, and draughts of camphor julep. At length I positively refused her any more, and entreated her to be still and calm; for she was frightfully impatient, talking incessantly, and begging for wine and æther. She had no oppression, but had the palpitation that night, and very much the following day. Her stomach at last grew very sick, and she discharged it, throwing off much bile; she seemed better afterwards, and grew a little composed: next day I fed her thirst with slops and broth; she was exceedingly ravenous. She is now much better."

The Messieurs Griffins commenting on this case, from whose work (p. 52) I have copied it, remark that the patient in her general state of health had a very slight appetite, and was never accustomed to more than the smallest quantity of wine or ale at any time. They think the state described connected with a feeling of nervous sinking, which is in some measure relieved by any thing taken into the stomach, and

recommend opiates, followed by some aperient, allowing at the same time some indulgence of the patient's appetite. I think the case is an interesting one, as elucidating the occasional bad effects of endermic irritants.

Even these affections may be periodical. A remarkable instance of this kind is related by Dr. Fuchs,[y] in which a sort of mania recurred every three or four weeks, and continued eight days, distinguished by the most irresistible and insatiable thirst for spirits, in a man otherwise healthy and steady. He died of it at last.

Pica.—A depraved appetite is one of the more common symptoms of hysteria, whether of the chlorotic form or of that which attacks women having a sexual system above par. Although during pregnancy some good wives "long" for handsome dresses, furniture, &c., yet these "longings" are spurious, since the morbid feeling belongs exclusively to the appetite for food. Ben Jonson notices these spurious longings :—

> *Littlewit.* O yes, Win : you may long to see as well as to taste, Win : as did the 'pothecary's wife, Win, that longed to see the anatomy, Win. Or the lady, Win, that desired to spit in the great lawyer's mouth, after an eloquent pleading.
>
> *Bartholomew Fair*, Act iii. Sc. 1.

It would appear that depraved appetite is under no general law, except that of great whimsicality; Dr. Elliotson mentions in his lectures as "an absolute fact," that "a patient has longed for raw flesh, and even for live flesh; so that some have eaten live kittens and rats;" (to eat a live rat is certainly a feat;) he saw a young lady who loved to munch brown paper, rather than gilt-edged and hot-pressed; one longs for a bit of a Priest's sleeve, and another dips her bread in a tar tub, &c. The best story about pica is that related by Langius, of a woman who lived near Cologne, who had such a bulimious longing for the flesh of her husband, that she killed him, ate as much of him as she could while fresh, and pickled the remainder, that she might enjoy herself now and

[y] In Henke's Zeitschrift für Staats-A. K. Bd. 34, Hft. i.

then with a tit-bit. A more marvellous masticator than the lady described by Ben Jonson.

> ——"she can cranch
> A sack of small coal, eat your lime and hair,
> Soap, ashes, loam, and has a dainty spice
> Of the green sickness."
>
> *The Magnetic Lady*, Act i. Sc. 1.

There is one general fact however, namely, that the depraved appetite is usually directed to something dry and tasty;—something too that will endure mastication, and make a pleasant crackle. I believe there are very few chlorotic young women that do not eat dry rice or unground coffee; more rarely, hard herring uncooked, or salt, mortar, chalk, cinders, sealing-wax, and other dry, tasty, crackly edibles. Sometimes, however, the appetite is more delicate, and the patient displays a taste which the most finished gourmand might envy. In others the perversion assumes a mixed form, and is connected with monomaniacal symptoms. Under the term "Temper Disease," Dr. Marshall Hall describes a species of monomaniacal pica. The affection is peculiar to females, and attended by impaired digestion, defective assimilation, some morbid state of the complexion, and the most extraordinary perversions of temper, most frequently with regard to diet; the patient will persist in a system of starving, or will only take the most improper food, or perhaps only such as can be obtained by a sort of theft. In this case the catamenia are usually suppressed.[z]

If the habits of the females of lower animals were closely watched during gestation and the parturient state, I think we might obtain a clue to the explanation of these extraordinary perversions of the appetite. It is well known that some of them, as sows and cats, will eat their offspring. Female gnats and *tabani* are carnivorous—they suck blood; but the males are not, as they live only on the nectar of flowers: for other illustrations see paragraph 127.

The following case will be read with interest; it is related by Vogel, a name well known in medicine.

[z] CV. p. 98.

Case VIII.—A married woman, aged thirty-two, had salivation during pregnancy, and aborted. She soon became again pregnant, and in the fifth month the salivation returned; towards the latter end she was troubled with pain in the abdomen, hæmorrhoids, and spasms of the bladder. Her whole family was subject to gout and hæmorrhoids; she was of a hysterical disposition, and an affection of the pancreas was followed by epigastric tenderness, nausea, vomiting, acidity of stomach, salivation, and a thick sandy urine. During her pregnancies she had been in the habit of taking powdered charcoal to relieve the salivation and acidity, and prescribed for that purpose by a physician; but during the last year and a half she had displayed the greatest liking for eating charcoal, munching it up without any disagreeable sensation, and solacing herself during her mental troubles by it; the greater her sorrow, the more she ate. She also found it to relieve the acidity and heart-burning, to which she was subject, as well as any unpleasant taste. It was at each menstrual period, however, that she most enjoyed the charcoal, so that the increased pica regularly indicated the flow of the menses; during the time they continued, she ate a great quantity daily,—about a "bonbonière" full. She went to the baths at Karlsbad, and also took sea-baths at Doberan, but without any beneficia result.[a]

Anorexia.—In no chronic disease is this symptom so constant, and so strongly marked, as in hysteria; it also is frequently connected with the monomaniacal state alluded to under the preceding head. Women generally love notoriety, and to excite approbation, wonder, or admiration; so that the surprise expressed by visiters and relatives at the small quantity of food taken by the patient, has seduced the latter into feigning the wonderful circumstance, that she lived without any food whatever. And hence the numerous histories of "fasting women," as they are termed, of which Ann Moore of Tutbury, and the Osnaburgh woman, whose history is given in Hufeland's Journal for 1802, are the most notorious. The former endured nine whole days without food or drink, displaying apparently an unequalled power of abstinence, yet the same has been repeatedly observed in cases of aggravated hysteria. Nothing is more true than that a hysterical girl will live and look fat on an incredibly small quantity of food, and that exclusively vegetable. I have perfectly satisfied myself of this; and a long list of most authentic

[a] CXXXVII. Zweite Supplement-Band, p. 96; from Hufeland's Journal. St. 9. 1836.

instances, displaying the same phenomenon, might be adduced.

Flesh-loathing—"kreatic" nausea (from κρέας, flesh).—I have ventured to give a name to a very prominent and peculiar symptom of aggravated hysteria and cases of anæmia, which, so far as I know, has not gained the particular attention of writers on the subject. It consists in a loathing of animal food in general, but of beef or mutton in particular. Sometimes chicken, or rabbit, or game, may be endured in small quantities; but so much beef or mutton as will make a couple of pills, will excite nausea and vomiting, as in case VI. Many instances of this kind are scattered through medical works; there is one in Schenk's Observations, lib. iii. obs. 277; others may be found in the selection which I have published elsewhere.[b] In Mr. Wadd's comical "Comments on Corpulency,"[c] it is quoted from Brassevolus, that the younger daughter of Frederick, King of Naples, could not eat any kind of flesh; a small piece would cause her to fall down, roll about on the ground, shriek out loudly, and faint. Slighter degrees of this nausea are very common in hysterical females, and also the severer, in both sexes, with greater frequency than is generally believed; but it passes without particular notice, being attributed to fancy and whim. In general, the embonpoint of flesh-loathers is little diminished by their exclusive preference of vegetable food, although the amount even of this taken by them is often incredibly small. From my own observations, and those of others, I am induced to conclude, that this symptom is almost peculiar to anæmious or hysterical individuals, especially those of arthritic diathesis, or with the hereditary predisposition to nervous diseases.

Hysteric Vomiting.—All the preceding symptoms are accompanied by more or less nausea and vomiting; sometimes, however, vomiting is the only prominent symptom, the stomach being so irritable that it rejects every kind of food and drink for many weeks in succession, and (as in the preceding cases) without inducing much emaciation, but often rather increased embonpoint. The pathology of hysteric nausea and

[b] VII. xlix., Cases 1, 2, 6, 15, 34, 36, 48.

[c] Vol. ii., p. 93.

vomiting is stated in another part of the work, (69,) to which I would refer the reader, and also to case 49, (observed by myself,) in my published selection of cases just referred to. This vomiting often resists every kind of medicine; and if the subject of it be of a delicate frame, is not free from danger. The sister of the subject of the case just referred to was affected also with the disease, so that it may be dependent upon constitutional peculiarities.

Treatment of Symptoms implicating the Stomach.—In treating the preceding symptoms, regard must be had to the general principles of cure; all are best remedied by air, exercise, and the metallic tonics, varying the latter according to the nature of the case, and combining them with stimulants, antispasmodics, and narcotics. The same treatment may be adopted in flatulent distension of the stomach, as in tympanites; there cannot be a doubt that the introduction of an œsophagus tube would be perfectly safe, and relieve the patient in the more severe cases. In addition to the usual carminatives, stimulant frictions on the spine, and stimulant plasters to the epigastrium, might be used. Above all, the relations of the general disease should be investigated, and suitable general treatment adopted. In Dr. Evans' case already noticed, it is not improbable that relief might have resulted from the administration of iron and colchicum in combination. Gastrodynia, pyrosis, bulimia, and polydipsia yield the most readily to trisnitrate of bismuth, and nitrate of silver. The former is usually given in five-grain doses, three or four times a day, in combination with powdered acacia-gum, ipecacuanha, and opium; the latter, first introduced into notice by Autenrieth, Ruff, and Dr. James Johnson, has been successfully used by Dr. Steinitz, of Greiffenberg, as follows:—

R. Argenti nitr. crystal. gr. v.
Solve in aquæ distillatæ q. s. et adde
Extracti taraxaci,
Pulv. rad. glycyrrh. āā q. s. ut fiat massa in pilulas xx dividenda.

One or two of these pills to be taken in the morning, and again in the evening, with mucilaginous drinks. The cases

most remedied by this treatment are those resembling case VII.[d] I have found it useful to substitute occasionally the sulphate of zinc for the nitrate of silver, changing from one to the other on alternate weeks, and so avoiding the danger of discolouring the skin by the nitrate. The arseniate of potass is useful in these affections, but the dose should not exceed five or six minims of the solution, three times a day, beginning with two minims; for sometimes the system is exceedingly susceptible of the action of this medicine. Small doses of blue-pill, with the compound ipecacuan powder (ana gr. iiss.) frequently repeated, will sometimes act magically, more especially in kreatic nausea, general treatment being at the same time adopted.

To relieve hysteric vomiting, when other remedies have been tried in vain, counter-irritation of the dorsal region of the spine is strongly recommended by the Messieurs Griffin and others, and I can bear testimony to its occasional utility; but stimulants and opiate liniments to the spine and epigastrium are equally efficacious, and, at any rate, if useless, do not aggravate the disease, as sometimes happens when counter-irritation is used with delicate women. It ought to be remembered, also, that the tender points on the spine are often exceedingly irritable, and much more easily excited than the sound skin; the torture of blisters and other irritants under these circumstances is dreadful. Stoll strongly recommends the application of a bag of hot salt to the epigastrium in hysteric vomiting.[e] Kreasote, oil of amber, assafœtida, galbanum, &c., are useful, both as external applications and internal remedies. A German physician cured a case of seven years' standing by small and frequent doses of champagne wine, paying due attention to the diet and bowels concurrently with its use.[f] Dr. Johnson related a case, at a meeting of the London Medical Society, of a young lady who had not been able to retain any solid food on her stomach for twelve months. She was much emaciated, but there were no signs of organic disease. Dr. Johnson gave the stomach entire rest, and administered thrice in twenty-four hours an

[d] XXXV. xiii., p 140. [e] XLIII. Pars iv., p. 439.
[f] CXXXVII. Zweite Supp.-Bd., p. 69.

enema composed of eight ounces of rich beef-tea, and fifteen drops of laudanum. Nothing was given by the mouth except a little milk and water to relieve her thirst. She recovered completely. Dr. Johnson had treated other cases on the same plan, and with success.[g] Dr. Simpson has found the oxide of zinc very successful.

When the hæmatemesis is of importance, grain doses of ipecacuan might be given every half-hour, with cold drinks, until the symptom is relieved.

When these affections recur in paroxysms, palliatives are urgently required, and these are best supplied by the so-called anti-hysteric medicines, namely, æther, compound tincture of lavender, camphor, assafœtida, musk, castor, amber, valerian, and the fœtid and musky medicaments in general; derivation to the pelvic viscera should be obtained if possible. Little need be said respecting the diet in these cases; obviously, as a general rule, flesh meat should be avoided; but the stomach may be induced to retain it should the debility be great, by applying sinapisms or other stimulants to the epigastrium, immediately after swallowing it. In cases of long continued vomiting, a mixture of milk and lime water has been retained, when every other food was rejected. The food should be well mixed with salt, a condiment patients of this kind neglect much.

b. The Pharynx, Fauces, Œsophagus, and their Appendages.

The reader is again referred to paragraph 69 in the physiological division of the work, for an introduction to this distinct class of symptoms. They illustrate well the intimate connexion there alluded to between the larynx and pharynx, and have, besides, a remarkable relation to the symptoms of poisoning by those agents which act specially on these structures, in being accompanied by morbid sensibility of the organs of sense, and of the excito-motory system,—the seat of tetanus.

Dysphagia; Globus.—The pathological state of the organs about the throat in hysteria is exactly similar to that of other organs, but the symptoms referred to them are more

[g] XXX. i., 1838-9, p. 416.

obvious, because they form part of the muscles of egress and ingress to the stomach and lungs. In these, equally as in other organs, there may be anæsthesia, or morbid sensibility; paralysis, or spasmodic action; arrested secretion, or profluvium. It is probable, however, that hysteric dysphagia more frequently originates in spasm of the œsophagus than in paralysis, (although Sir B. Brodie seems rather to attribute this symptom to the latter,) for morbid sensibility usually precedes the paralytic state. This remark I confine entirely to cases of aggravated hysteria; since nervous individuals suffer upon any excitement a temporary paralysis of the œsophagus, so that a bashful man, when at a dinner-party, in which he is ill at ease, has the greatest difficulty in swallowing, and may be observed to do it by an effort; and such also may be the case in the hysteria which amounts to no more than nervousness. The hysteric globus has usually been considered to consist of flatus arrested in the œsophagus; this causing the sense of suffocation by pressing on the trachea. In some cases it may so occur, for sometimes the throat is swollen; but in many I am convinced this peculiar sensation is to be attributed to spasm of the alimentary canal, commencing (as most nervine phenomena) at the point farthest removed from the sensorium, and gradually involving the whole tube to the œsophagus and pharynx; the laryngeal muscles become partially affected at the same time, so that the sensation is a mixed one,—the contracted œsophagus being the ball or globus, the partial closure of the larynx originating the choking; and if the practitioner will inquire minutely, he will find that in some cases these sensations occur independently of each other; that is, the globus without the choking sensation, and *vice versâ*.

When the dysphagy is temporary, the affection is scarcely worth notice; but when accompanying anomalous symptoms, and dependent upon morbid sensibility of the œsophagus, it is a grave affection. Like all the symptoms affecting these parts, it is difficult to cure or even to palliate: the patient finding deglutition painful, gradually diminishes the quantity of her food, and the irritability of the system and of the œsophagus increases *pari passu* with this diminution, until

the attempt to swallow excites hydrophobic gasp, spasm of the respiratory muscles in general, and even universal tetanic convulsions, and the patient sinks at last exhausted. The following case may serve to exhibit the affection in its milder form, and its accompanying symptoms:

Case IX.—Sarah Tiplady, a single woman, aged about twenty-eight years, the mother of one child, was admitted into the York County Hospital, May 26, 1836, having aphonia, great difficulty in swallowing, and a violently spasmodic barking cough. I found that the cough recurred principally in the evening, and was occasionally accompanied by a sensation of imminent suffocation, suffusion of the face, convulsive efforts, a degree of insensibility, and tumefaction of the abdomen. There was great irritability of temper, and cephalæa, and she had sleepless nights. The tonsils were somewhat enlarged, but no other change about the fauces could be detected, and an œsophagus bougie passed easily along the gullet; she complained, however, of heat and tenderness of the throat, but there seemed no more than would necessarily follow the convulsive efforts made occasionally to swallow and breathe. The mammæ were flaccid, the catamenia very irregular, and occasionally profuse. She was in the hospital four months; during which time mercury, conium and ipecacuan in combination, tonics, counter-irritants, leeches, local sedatives,—as opium and belladonna,—were all used with very little success. Æther relieved the paroxysms, and full doses of the sedative liquor procured sleep. She left the hospital somewhat better. She had suffered from the same affection during the preceding year.

Morbid Sensibility of the Pharynx; Hysteric Hydrophobia.—Mere irritation of the pharynx and fauces excites vomiting; but when there is morbid sensibility of the pharyngeal mucous surfaces, the spasmodic action excited by any irritant is communicated to the larynx, and a distressing sensation of suffocation will be the consequence, as occurred occasionally in the case just related. But fluid ingesta alone excite the peculiar gasp in many, and hence the resemblance of this affection to true hydrophobia, a resemblance rendered more striking, because (as in dysphagy) the morbid sensibility of the whole system, but particularly of the mind and cerebral organs, is wonderfully developed; so that the slightest touch, or sounds, and vivid colours, will excite the spasmodic action of the larynx, and tetanic or convulsive movements. Dr. Parry relates two or three instances of hysteric hydrophobia in his Essay on Tetanus and Rabies Contagiosa.

Frequent Sipping.—There is an irritable state of the larynx, pharynx, or epiglottis, in which the patient feels a necessity for a continually-repeated act of swallowing a fluid, to prevent suffocation: although diametrically opposite in its nature to the preceding affection, it is accompanied by almost precisely similar symptoms. The following case, which came under the care of Dr. Graves, will best exhibit its characteristics.

CASE X.—Dr. Graves was called to a young lady who was represented to be in a state of imminent danger. On entering the lady's room, he found her surrounded by several female friends, all in the greatest alarm. Her countenance was pale, and had an anxious expression; and about every five seconds she sipped an extremely small portion of water, which she immediately swallowed, but with a considerable effort, although the quantity was so trifling. She said that she should be immediately choked if she discontinued the sipping; for the moment she attempted it she felt an intolerable uneasiness at the root of her tongue, and in her throat, threatening immediate suffocation; and so urgent were these sensations, that if an attempt was made to prevent her sipping, she immediately screamed in agony, was agitated with convulsions, and seemed about to expire. She could make a full inspiration without wheezing or noise in the chest, and there was no appearance of disease at the root of the tongue or in the fauces. She was a young lady of an extremely delicate and nervous habit, being very sedentary, and subject to frequent attacks of common hysteria. Dr. Graves, aware of these circumstances, immediately removed a number of leeches which were attached to her throat, stopped the bleeding as soon as possible, and gave her draughts of camphor, aromatic spirit of ammonia, and blackdrop; under the influence of which, the nervous irritation soon subsided, and she fell asleep.

Hypertrophy of the Mucous Membrane of the Pharynx.—Both nervous women and men, particularly clergymen, have occasionally a morbid state of the mucous membrane of the pharynx, usually of the posterior wall, and which, from my own observations, I am inclined to attribute to a hypertrophy of that structure; it appears puffy and œdematous, and usually marked with yellowish red or yellowish white striæ; but when inflamed, is of a vivid red. To remove the tough mucus which collects in the upper part of the pharynx, the patient has an habitual hemming or hawking, or a sort of bastard cough, compounded of both. In women it is usually accompanied by enlargement of the tonsils; in men, by func-

tional disease of the liver, and hypochondriasis; in whom it will end in ulceration, extending to the larynx. It is almost always aggravated by gargles, or those means which direct the patient's attention frequently to the throat. An occasional pencilling of the posterior wall of the pharynx with nitrate of silver, is useful.

Treatment of Symptoms implicating the Throat.—A correct diagnosis should first be carefully established, before proceeding to treat any of these symptoms; and this is by no means difficult, if the history of the case be well inquired into; and if inflammatory, little harm will arise from delaying the treatment; while, on the other hand, active antiphlogistic measures will not only aggravate the urgent symptoms, but also lay the foundation for protracted and incurable disease. The antispasmodic remedies, as valerian, musk, &c., liniments of opium, camphor, and belladonna, or other local sedatives, and the cold affusion, will best relieve the paroxysm. The cold affusion must not, however, be trifled with; for a partial or brief use of it may aggravate the symptoms, and excite others: for instance, I have known incurable aphonia attributed to its use. If the strength of the patient be below *par*, and the cold affusion be indicated, the contemporaneous administration of stimulants ought not to be omitted. Counter-irritants to the cervical and dorsal spine have been found useful. In adopting a general plan of treatment, the arthritic diathesis should be inquired after, as these structures are much oftener affected by gouty sensibility, neuralgia, &c., than is generally supposed.

c. The Tonsils, Uvula, Eustachian Tube, and Salivary Glands.

The remarks in paragraph 64 and following will serve as an introduction to this class of symptoms; and to these I refer the reader.

Hypertrophy of the Tonsils.—Enlargement of the tonsils is a very common annoyance of the hysterical female; and the left, I have observed, suffers oftener, and, when both are affected, is larger than the right. The hypertrophy is usually similar to that of the thyroid body, mammæ, and uterus,

consisting simply in enlargement of its proper structure; but occasionally it is formed by a distended follicle.

Fœtor of the Breath.—It is the secretion poured out by the tonsils, which gives the fœtor to the breath so often observed in hysterical women, and of which they frequently complain. The best mode of relieving it, is by stimulating the tonsils and forcing the peculiar secretion from the small follicles by mechanical means.

Discharges from the Ears.—The vicarious secretion of urine from the ears is a well-established fact; a sanguineous and sero-sanguineous fluid is not unfrequently discharged. There are few data for explaining the source of these discharges, but it is probable that the Eustachian tube is involved in the irritation by which the adjoining structures are affected. It is possible, however, that these fluids may have been forced through the tube by a voluntary effort; for hysterical girls will feign anything. A young female, in the York Hospital, had sanguineous discharge from the ears; and as I examined them very carefully from time to time, she placed two or three small pieces of mutton bone in the external meatus, to assist me, I suppose, towards an explanation; and showed me two or three other little bits that she had extracted, as she said, but which she had evidently obtained from her food.

Deafness.—This usually comes on, in aggravated cases, by metastasis from some other organ, and disappears in the same way. Sometimes the auditory nerve is affected, more frequently the Eustachian tube; the former, in cases of extreme anæmia; the latter, in those of vicarious discharge, or irritation of the mucous membrane.

Salivation.—The reader is again referred to remarks in the physiological division of the work, (65, seq.,) on the connexion between the salivary glands and ovaria. He will then readily understand why salivation occurs occasionally in hysteria. Perhaps it is really present in a slight degree much more frequently than it is noticed, but is obscured by graver symptoms. Sydenham says, hysteric subjects will spit a thin saliva for many weeks, as if it were produced by mercury;[h] Whytt notices

[h] IV. ii., p. 105.

salivation repeatedly, and attributes it to "an unusual motion of the vessels;[i] Cheyne remarks, that it is common in vapours, and "usually said to be of scorbutic origin;" alluding probably to the occasional red colour of the saliva.[k] Ballonius, Mauriceau,[l] Stoll,[m] Pomme,[n] Rowley,[o] Darwin,[p] Villermay,[q] and Burrowes,[r] all notice salivation as a symptom of hysteria. The fluid excreted is rarely mixed with pulmonary expectoration; it is generally watery or slightly mucous, frequently of various shades of colour from a brown to a deep red. It unquestionably comes from the salivary glands, thyroid body, or surfaces contiguous. Dr. Graves thinks it is from the fauces. Aretæus alludes probably to an expectoration of this kind in his description of hæmoptoë: "Frequently the rupture takes place in the gullet, and if so, the blood does not flow in large quantities, as from the chest; it is not very dark, but rather of a yellowish colour; it is not exactly homogeneous, and is mixed with saliva. It is rejected with nausea and vomiting, and there is a slight cough. Sometimes, if the disease is prolonged and becomes chronic, the patients have a great dislike to food, and vomit it. The fever is by no means long continued, but is erratic."[s] This description applies exactly to the sanguineous salivation of the hysterical. It is worthy remark, that spontaneous salivation is sometimes connected with gout.[t]

Brown dry Tongue.—Dryness of the mouth is common in other diseases, but there is a peculiar form observed in hysteria, dependent apparently upon an almost total suppression of the salivary secretion. The tongue is seen of a mahogany colour, sometimes perfectly dry, sometimes moist on the edges for about the breadth of half-an-inch. It is to be seen also in individuals who have suffered a violent attack of fever, of which it is one of the most obstinate sequelæ. The symptom is worthy notice, because when in a marked form it might readily cause the practitioner to suppose his patient had severe

[i] XCVIII. pp. 531, 533, 599. [k] CXXVI. p. 146.
[l] XLVI. i., p. 452. [m] XLIII. Pars. vi., p. 228. [n] VI. p. 2.
[o] CXXVII. p. 143. [p] XLIV. iii., p, 261.
[q] XLII. xxiii., p. 249. [r] CXXVIII. p. 193.
[s] IX. Lib. ii., cap. 2. [t] CXXXVII. xxvi., p. 23.

typhus or a gastro-enteritis, a mistake, if acted on, which would lead to dangerous treatment.

The Teeth.—Toothache is almost as common in hysteria as headache; the teeth are often much decayed, and in a peculiar manner, as if cankered; and the gums are spongy and readily bleed. It is better not to extract the teeth even if decayed, for hysteric toothache, unless abscesses form; for the pain can usually be relieved by improving the general health, or by the medicines and treatment suitable for other neuralgiæ: a pill made of powdered opium and water, and introduced into the tooth affected, will afford temporary relief.

SECTION II.

THE CIRCULATORY APPARATUS.

SINCE in nervous people, that organ, the innervation of which, either from hereditary predisposition or peculiar agencies, sinks below the par of health, will be affected with nervous disease, it cannot be expected that the heart will escape, when we remember the numerous causes by which its healthy action may be interrupted, especially in females. These causes, however, induce in them only functional disease, rarely organic, (63,) for they have no violent muscular efforts to make, and the osseous deposit in the textures of the coronary arteries and large blood-vessels, so evidently connected with the arthritic diathesis, rarely takes place in them. Nevertheless, there may be, and often is, in debilitated individuals, arthritic functional disease of the heart; and this should be remembered in adopting a plan of treatment.

Angina Pectoris.—Although this disease is usually referred to the heart, the opinion may be fairly questioned; for all the morbid states of that organ usually found after death from angina pectoris, have been found also in persons who never had one paroxysm of the disease; in fact, like cardialgia, angina pectoris may depend upon disease of the brain and spinal cord; it has probably a mixed origin,—the local organic disease being in men the exciting cause, irritation of

the nervine connexions of the heart, the predisposing; while in women, (the same predisposition being present,) the exciting causes are those of hysteria in general. Like analogous affections, it is hereditary.[u] The affectibility of those suffering from angina is clearly analogous to that of certain other neuralgic and spasmodic diseases. A breath of cold air, sneezing, or any slight muscular effort, or the state of the system during incipient sleep, will induce a paroxysm. So also a mental effort will either induce or prevent it.[v] The neuralgic affectibility in this, as well as other diseases of the thoracic viscera, extends to the skin, so that pressure on it, particularly on the median line, will excite a gasp. The posterior median line, however, seems more sensible than the anterior. Just as in the analogous disease, asthma, the stomach and colon are distended with flatulence, but especially the stomach. Dr. Forbes, in his lucid Essay on Angina Pectoris,[w] thinks there is little reason to doubt that the gas is formed in the intestinal canal, during, or immediately before, the paroxysm; I have alluded already to this symptom, and extended the views of Dr. Forbes. (See *ante* p. 251.)

Angina pectoris seldom occurs in women in all its intensity, but rather under the form of occasional aching pains in the anterior part of the chest, radiating to the neck and epigastrium, and down the left arm, which is sometimes slightly paralysed. Both arms are occasionally affected, and also the loins, abdomen, and legs. It may be complicated with syncope, and the general phenomena of hysteria, and will assume the intermittent form.

Syncope.—This is not an unusual affection of delicate anæmic women, and when alone, is of no importance. It, however, also accompanies the more remarkable symptoms,—as catalepsy, catochus, &c., and it then becomes of great moment, as when it continues long it constitutes one of the most striking symptoms of apparent death. Dr. Hope thinks the action of the heart not wholly suspended in these cases, and that the second sound might be heard with the stethoscope.[x] Occasionally it is the most prominent symptom of

[u] CXVI. ix., p. 312.
[v] Dr. Black, XLV. vii., p. 75.
[w] XV. i., p. 91.
[x] CXXIX. p. 522.

the hysteric paroxysm, and sometimes it appears as a regular intermittent. A very curious instance of this may be found detailed at length in the third volume of the Dublin Medical Journal.

Palpitation.—The heart is analogous to other hollow muscles, and its lining membrane is supplied with nerves of special physical sense, the powers of which are exalted or destroyed by nervine alteratives of every class. Paralysis of these nerves is the cause of death in many cases of poisoning.[y] The motor or white fibrils of the heart are derived from the spinal cord, as well as from the sympathetic, and are analogous in structure to spinal motor nerves (Müller), and hence we can readily conceive how mental emotions may affect its movements. But the heart being developed from the vascular layer of the embryo, (which is derived from the serous and mucous layers,) it must partake of the properties of both the voluntary and involuntary systems. It is thus, that, like portions of intestine, the heart acts after removal from the body, and thus, also, that a motor excitement traversing the cord is propagated to the heart. We can thus explain the increased cardiac action during muscular effort, as when a person rises into the erect from the prone position, or in lifting, running, &c. Consequently, the more quiescent the muscular system is, as when lying, the less frequently will the heart act.

We may therefore confidently infer, that any causes sufficient to excite other parts of the cerebro-spinal system may excite those in connexion with the heart, either by a local action or through the blood, and so increase or diminish the movements of the heart, or interrupt their rhythm; and induce the consequent symptoms, namely, faintness, syncope, palpitation, cardiogmus, &c.

The hysteric, or, more properly, *neuræmic* palpitation, presents several varieties. Sometimes the strokes of the heart are incredibly rapid, in which case there is faintness or syncope. Dr. Williams lately mentioned to the Westminster Medical Society an instance of hysteria, in which, for the space of a week, the heart's action was so exceedingly rapid, that the

[y] Müller, XIII. p. 735.

pulse could not be counted. I have known the pulse to be 140 to 155 for many days. When the palpitation is in a less degree, the pulse is quick, weak, fluttering, and irregular, with a quivering sensation in the epigastrium, slight anxiety, and quick breathing; slight mental excitement, or muscular effort, readily induces this. The slightest kind (according to Dr. Hope, who experienced it himself) is a tumbling or rolling motion of the heart, with a momentary feeling of tightness and oppression; this form, Dr. Hope says, is referrible to an intermission of the heart's action; it is the cardiogmus of Galen.

Diagnosis of Palpitation.—No one, who has well considered one case of hypertrophy of the heart, can mistake nervous palpitation for that disease. In mere palpitation there is no lividity of the lips or cheeks,—no stupor, or general lifelessness of manner; on the contrary, the patient is often nervously vivacious, and susceptible of the slightest mental excitement, which immediately accelerates the pulse. Any cause acting on the surface of the thorax, or on the stomach or lungs, too slight to affect the heart when hypertrophied, will readily increase nervous palpitation, as taking food, breathing a close atmosphere: the arrival of the practitioner, &c., will have this effect; but exercise diminishes it, while, *è contra,* in hypertrophy it is increased. When the palpitation is connected with anæmia, there ought not to be the slightest difficulty in deciding upon its nature. With regard to the physical signs, they are obvious enough. The heavy heaving impulse of the hypertrophied heart contrasts strongly with the abrupt, sharp bound in nervous palpitation; in the former, the stroke lifts the head or hand, in the latter seldom. Dilatation, and the bruit de soufflet, are readily referred to their appropriate causes by the same general observations.

Can hypertrophy of the heart supervene on nervous palpitation? Yes, in hypochondriacal men, or in women past middle age; but, I believe, seldom in young hysterical females. The fact is, that in the former, the causes of the palpitation have a permanent action, increasing in intensity, while in the latter they are ever changing, and sometimes disappear altogether.

Epigastric and Abdominal Pulsations.—In some few cases, especially those complicated with gastrodynia or its analogues, these pulsations are perceived. Sauvages (according to Dr. Elliotson, but I cannot find the reference) attributes them to morbid sensibility of the arterial system, particularly of the gastric arteries and aorta. Pomme refers them to the cœliac and superior mesenteric arteries and aorta.[z] The nature and causes of these pulsations have been discussed from the time of Morgagni downwards, without educing much very exact information upon their pathology. There is a respectable essay on the subject in the first volume of the American Cyclopædia of Practical Medicine. It is only necessary to remind the practitioner of the occasional existence of these pulsations in hysteric females, so that they may not be mistaken for aneurism.

Diagnosis of Hysteric. Pulsations.—When there is no tumour pressing on the aorta, the diagnosis is easy from a consideration of the general symptoms and physical signs. Dr. Hope says,[a] that the stethoscope, pressed down on the aorta, will yield a distinct feel of the vessel of its natural calibre; then, again, the pulsation is extensive longitudinally, and limited transversely. The impulse is a smart and vigorous jerk, instead of the gradual, steady, and irresistible heaving of an aneurism; and the sound, when any exists, is audible along the whole vessel, and not in one particular spot. Even if a tumour exist, attention to the general symptoms will clear up the case.

SECTION III.

THE RESPIRATORY APPARATUS.

The present section will be limited to a consideration of the symptoms implicating the air-passages only; the spasmodic affections of the laryngeal and respiratory muscles in

[z] VI. p. 2. [a] CXXIX. p. 464.

general, although not easily separable from them, yet being more conveniently noticed under other heads.

The symptoms implicating the air-passages differ from others in this, that they are the most common, the most alarming and distressing, and the most liable to be mistaken for inflammatory or organic disease, especially those in which there is morbid sensibility of the mucous membrane, giving rise to increased secretion, and to spasm or paralysis of the muscular fibres of the bronchi.

Although these symptoms will be treated of as if their true seat were in the lungs or air-passages, it must be borne in mind that these organs are frequently quite free from real disease, and that it is irritation of the nervous twigs, either in their cerebral connexions, or in their transit through the respiratory ganglia or spinal medulla, which is the true cause of the whole class, as well as of others.

Asthma.—Hysteric difficulty of breathing differs altogether from panting respiration (see page 287); it resembles common asthma in its most striking symptoms, but is often accompanied by aphonia, croupy respiration, odd coughs, and not unfrequently by expectoration of bronchial mucus; so that it is difficult to distinguish it from true bronchitis, or at least to be certain that it is not complicated with inflammatory action.

Like most other paroxysmal diseases, it has been observed to return at regular periods; it is frequently quotidian, sometimes tertian, and often hepta-periodic. "In one case mentioned by Wainwright, the paroxysms always returned at the menstrual period during a space of seven years, and in another recorded by Fransieri, in the first volume of the Memoirs of the Royal Academy of Madrid, they are stated to have recurred at every new and full moon, for no less a period" than three times seven years.[b]

Independently of periodic agencies, all depressing causes will excite a paroxysm; as exposure to cold, indigestion, any slight exertion, mental emotion, the state of the nervous system during incipient sleep, &c.

[b] Dr. Forbes, in XV. i., p. 185.

Writers have differed in opinion respecting the seat of spasmodic asthma. Whytt says, "The predisposing cause of this disease is a particular weakness and delicacy or sensibility of the pulmonary vessels and nerves, which renders the musculo-tendineous membrane connecting the annular cartilages of the bronchia liable to be affected with a spasmodic contraction."[c] Dr. Forbes considers the affection to be spasm of the muscular fibres of the bronchi, and has traced an analogy between it and spasm of the glottis.[d] He thinks the respiratory muscles are not involved in the spasmodic action, but the spasmodic ejection of the fæces during a paroxysm, and the positive testimony of asthmatics, show that this opinion is contrary to fact.[e] Dr. Hope considers this spasm of the muscles to be a secondary symptom consequent upon the spasmodic constriction of the bronchial tubes;[f] but these tubes may be paralysed as well as spasmodically contracted; indeed, all analogy leads us to the conclusion that the disease may exist in all grades of severity from slight morbid sensibility of the pulmonary mucous membrane to violent spasm of the whole respiratory system, ending in paralysis.

Diagnosis.—The only difficulty in the diagnosis of this, as well as other paroxysmal diseases, is at the first attack; and the only disease with which it is liable to be confounded is bronchitis. Dr. Forbes remarks that, in inflammatory affections, the chest is still capable of considerable dilatation, even in the severest examples, which is never the case in the asthmatic paroxysm.[g] But I fear the presence or absence of febrile symptoms, to which Dr. Forbes alludes, will avail little in the diagnosis of many cases of asthmatic females. The presence of sternal or spinal tenderness, the impatient, peevish manner, the peculiar hysteric expression of countenance, and the previous history of the patient, will be more useful. If the paroxysm can be arrested by an impression on the mind, there can be no doubt of its real nature; acute inflammation never succumbs to these mental alteratives.

Treatment of Asthma.—The general principles to be fol-

[c] XCVIII. p. 601.
[d] XV. i., p. 185.
[e] See Journal of an Asthmatic, XXXV. xiii., p. 24.
[f] CXXIX. p. 397.
[g] Op. cit., p. 195.

lowed in the relief and cure of other paroxysmal diseases are equally applicable to this; local applications may diminish the neuralgic sensibility when there is tenderness of the surface. There are, however, some modes of treatment more applicable than others, for we can apply sedative gases and vapours directly to the mucous membrane. Of these, very much diluted carburetted hydrogen, the smoke of stramonium and of tobacco, are recommended; probably numerous other sedative vegetables, gases, and medicated vapours, might be beneficially exhibited. Many stimulants act as sedatives in this affection, such as æther, coffee, &c.; and sedatives, as stimulants; while, on the contrary, the sedative will depress the depressed system still more, or the stimulant over-excite, and so aggravate the affection. These effects plainly depend upon a disproportion between the dose of the medicine, and the degree of exhaustion of the patient.

The treatment during the intervals between the paroxysms must be regulated by the state of the lungs; if there be no pulmonary disease, the same treatment as for gastrodynia and analogous affections, may be adopted; but the oxyde of zinc might take the place of the trisnitrate of bismuth; from five to twenty grains to be given three times a day, as recommended by Dr. Withers. Dr. Lombard has found this oxide useful in an analogous affection, namely, hooping-cough.[h] There is often great difficulty in persuading an asthmatic female to take exercise in the open air; she says, "the air takes such hold on her chest, she cannot;" or she has the utmost dread of catching cold. It is unquestionable that the bronchia are painfully susceptible of impressions; but the amount of danger or inconvenience incurred by exposure to the air is counterbalanced by the improvement in the general health and the consequent palliation of the disease, and, certainly, at the utmost, is trifling when compared with the injury done to the system by confinement in warm and close apartments. If the latter plan be adopted, month after month of suffering will be the consequence, and the patient linger on, a helpless, shattered invalid. There are not a few practitioners who advocate

[h] XXXV. xiv., p. 275.

and adopt this method of treatment, with whom the following opinion of Dr. Billing may have some weight: "There is no more common error than that of excluding the air from patients who have that kind of cough called spasmodic asthma, especially those cases which depend on chronic (Laennec's dry) catarrh, and which I find are curable much more quickly, provided the patient be sent out to take exercise in the open air, even in winter." [i]

Hysteric Bronchitis, or Bronchorrœa.—Since, in hysteria, the other secreting organs are affected by profluvium, it is not probable that the lungs should escape; and yet we have no instance of hysteric bronchorrœa on record; for the cases recorded as being complicated by inflammatory attacks, spitting of blood, &c., can scarcely be considered as examples. It appears never to have been suspected that the symptoms so described might originate in morbid sensibility of the pulmonary mucous membrane, and be altogether independent of true inflammation. I believe true bronchitis is very rarely met with indeed in females; and those who suffer are amongst the vagrant class, as camp-followers, hawkers, beggars, &c., who are exposed to great and severe changes in the weather.

A curious case, which I think ought to have been classed under this head, came under my notice at the York County Hospital; it was originally published in the twenty-first volume of the London Medical Gazette, but will probably be thought deserving of a place here.

Case XI.—Sarah Battley, aged twenty years, wife of Hospital-serjeant Battley, of the 10th Hussars, was attacked in January 1837, with a pain under the right scapula, extending round the side to the anterior lateral region of the chest; it was aggravated when she coughed or breathed, catching her suddenly. She was relieved by bleeding, and suffered from nothing but a slight cough until April 17th. She was then exposed to cold, and experienced some fatigue and anxiety. The pain now recurred, and extended to beneath the right mamma; she had daily pyrexial paroxysms, commencing about noon, and not terminating in sweat. Her cough also became more severe, the expectoration more profuse; and on the 23rd, she observed the sputa to have a very disagreeable smell, which gradually became more perceptible, and at last highly offensive. The thirst from which she had suffered since the commencement of the attack now became exces-

[i] CXXI. p. 257.

sive. She was admitted into the hospital April 27th, under the care of Dr. Belcombe. The following was her state:—She suckled her first child for twelve months, and weaned it six weeks ago; milk can be squeezed from the nipples. Complains of violent cough, attacking her in paroxysms, which continue from fifteen minutes to two hours, causing great pain in her head, and accompanied with a profuse expectoration of a muco-purulent fluid, having a distinctly fæcal and highly offensive smell. Her bowels have not been moved for two days; she is pale, and has an anxious expression of countenance. Her friends suppose her to be in a *galloping consumption*. There is bronchophony in each upper and anterior region of the chest, most marked on the right; pulse eighty, steady and feeble; tongue clean and moist; appetite impaired and fastidious; thirst excessive, the patient drinking two or three gallons of fluid every day; temper irritable and desponding.

She remained in the hospital nine days, during which time she was attacked every other day by violent fits of vomiting and coughing, which were just like those of hooping-cough; they usually began at five or six o'clock in the morning, and continued for from two to six hours, during which time she expectorated an almost incredible quantity of a whitish-grey, thick, muco-purulent fluid, having an odour abominably fæcal when the paroxysm was most violent; like that in some forms of chronic diarrhœa, as the paroxysm declined; and towards evening, or on the day intervening between the paroxysms, like a decayed apple. She said she was sure her lungs were rotten. If she attempted to lie supine, or on her right side, the dyspnœa excited amounted almost to suffocation. She had pain in the right anterior and upper portion of the chest; in the same region, puerile respiration and pectoriloquy; on the opposite side, puerile respiration and bronchophony; no rattle on either side; she had also pain beneath the right mamma and scapula, and said her right side felt as if there were no bones in it, it was so weak. Her thirst was as excessive as that of a diabetic patient; and she had a gallon pitcher of water, acidulated with nitric acid, at her bed-side, which she emptied two or three times a day. Her pulse, on one occasion only, (in the evening,) was so high as 114; seldom above 100, usually about 80; her bowels were constipated. In the intervals between the paroxysms she could walk out in the garden; had some degree of appetite; her tongue was clean, and her pulse was regular. She was always desponding; her temper was intolerably acrid, nothing pleased her; and at last she took pet with her food, and left the hospital, no better. A few weeks after, I learnt that she subsequently had a rapid recovery, and joined her husband at Nottingham, in good health and spirits.

At the time I observed this case, I could only convince myself that the disease was *not* tubercular phthisis; but from more extended knowledge, I am now inclined to consider it as a mixed case of hysteric bronchorrœa, asthma, and spas-

modic cough. The moral causes of the disease, its intermittent type, the spasmodic cough and dyspnœa, the excessive thirst, absence of febrile symptoms, irritable, capricious temper, and the rapid recovery, are all in favour of this view of the case. It may be objected, that there was pectoriloquy; but this might easily arise from dilatation of a bronchial tube; for if in any degree paralysed, the bronchi would become necessarily distended, and, in favourable points, dilated by the enormous profluvium.

If the sputa had been mixed with bile, they would have been exactly similar in odour, colour, and consistence to the thin fæces found in the small intestines. Is it possible that the bronchial mucous membrane had assumed *pro tempore* the functions of the intestinal? If so, we have here another curious instance of the conversion of function in nervous diseases. General pathology is not without facts in support of such an opinion. The only importance I would attach to this case and the preceding remarks is, that if the new view I have taken of these anomalous diseases be acted on, it may lead to an improved method of cure. In a similar case I should administer quinine, and the metallic tonics and astringents, in combination with the fœtid gums.

Hæmoptöe.—When hæmoptöe is added to the more aggravated symptoms, there is a state of the system which might be termed purpura, or scorbutus. In some cases it is vicarious of the menstrual discharge, takes place at weekly or monthly periods, and is accompanied by the usual constitutional disturbance; but in others will follow a slight blow, a mental emotion, or any of the exciting causes of hysteria in females otherwise without any well-marked hysteric symptom. Individuals subject to this hæmoptöe resemble those liable to hæmatemesis; they have a florid complexion, considerable embonpoint, are of arthritic or hæmorrhagic constitution, with an excitable temperament, and have experienced previous attacks of hæmorrhage, "brain fever," or "inflammation," for which they have been largely depleted *secundum artem.*

Diagnosis of Hysterical Hæmoptöe.—The general history and symptoms, in combination with the physical signs afforded by the stethoscope, will be the best guide in distinguishing

this hæmorrhage from that which ushers in tubercular disease. It may be also added, that it is most usually accompanied by an incessant sonorous barking cough, which teazes the patient and all around her night and day, and creates the most vivid alarm least it be the forerunner of phthisis: this cough is, however, very unlike that of the consumptive; it appears to proceed from the pharynx or trachea, rather than from the lungs, and the quantity of blood expectorated is seldom large. Occasionally hæmoptöe accompanies bronchitis, but there can be no danger of mistaking the two affections.

Treatment of Hæmoptöe.—When complicated, the general symptoms being removed, it will cease; when a solitary symptom, mild tonics with ipecacuan may be useful, with pediluvia, stimulating liniments to the loins, and other derivatives to the pelvic viscera. Gentle exercise out of doors should be strenuously insisted on; I have found this, aided by small doses of saline aperients in large quantities of water, sufficient to remove the symptom.

Hysteric Catarrh; Fits of Sneezing.—In some rare cases, the mucous membrane of the nostrils is the seat of morbid sensibility, and the patient is annoyed by lachrymation, copious mucous discharge from the nostrils, and continual sneezing; there are also toothache, formication on the face, &c., with general hysteria. Sir B. Brodie relates two cases in his Lectures on Local Hysterical Affections. One of these was heptaperiodic, the fits recurring at first once in a week; but three years after, not oftener than once in a month.[k] Sir Benjamin does not mention the treatment he recommended: the carbonate of iron has been found useful; a pinch of snuff has cured when nothing else could.[l] It is probable, the treatment, local and general, suitable for other local neuralgiæ would be useful in this affection; and it ought to be remembered that even this curious affection may be arthritic. I know well a gouty old gentleman who is occasionally attacked by fits of sneezing; they last about five minutes, during which time he sneezes most violently and incessantly: he stops the paroxysm

[k] XIV. xix., p. 249. [l] XCIII. xxv., p. 501.

by drinking some fluid, and then holding his breath. He can trace the fits most distinctly to the gout; and he has had too much experience of the disease to be mistaken.

Dyspnœa; Laryngismus stridulus; Spasm of the Glottis.—These symptoms are present in a great variety of hysteric affections, appearing as oppression of the breathing, suffocation, croupy respiration, &c. The spasm of the glottis observed in the hysteric paroxysm has been already noticed; it is present also in most paroxysmal affections, is generally incomplete, and usually ceases on the approach of insensibility: it is in this point, indeed, that the great distinction between hysteria and epilepsy may be found; for the coma or insensibility of the epileptic most probably depends upon the total, although temporary, cessation of respiration, which does not occur in the hysteric paroxysm. Sometimes this hysteric spasm of the glottis continues for a length of time, and, by partially interrupting respiration, prevents the due aëration of the blood, and its return from the brain; the patient in this case passes sooner or later from the state of hurry and excitement into a comatose or convulsive state, and death at last supervenes, as occurred in the well-known case related by Villermay.[m] I remember, when at the York Hospital a nurse coming to me early one morning to inform me that one of her patients had been convulsed for some time, and was then dying. Having seen no signs of approaching death when I visited her the previous evening, and feeling much surprised at the announcement, I rose and went to her immediately. I found her comatose, her lips slightly livid, her jaw firmly shut, her hands clenched,—in short, like a person being strangled. I immediately forced down the lower jaw, introduced my finger into the pharynx, and succeeded in exciting slight retching; she then respired heavily once or twice, in a few minutes was able to swallow, and shortly recovered. In this patient, hysteric had passed into epileptic paroxysms, and it is in such cases that we have laryngismus stridulus.

Coughs.—There are four kinds of coughs, easily distinguishable by the *timbre* or intonation peculiar to each, namely,

[m] XLII. xxxiii.

the spasmodic, the ringing or clanging, the barking, and the grating. They all originate from irritation of the pulmonary mucous membrane, but (judging from the sounds) at different points; in the first it is seated, probably, in the rima glottidis, or on the epiglottis; in the second, on the inner surface of the larynx, or upper part of the trachea; in the third, in the bronchi; in the fourth, in the pharynx. Sometimes they are blended, and there will be a spasmodic barking cough; sometimes the patient will cough naturally between the fits; sometimes the cough will be ringing at one time, and barking or spasmodic at another. They are most usually accompanied by other affections of the air-passages, as aphonia, dyspnœa, &c., and are occasionally periodic.

The Spasmodic Cough.—This closely resembles hooping-cough; occurs after taking food; and is accompanied, often, by dreadful straining and convulsive agitation, and even by hysteric or epileptic convulsions.

Laryngeal or Ringing Cough.—This is usually accompanied by dyspnœa, aphonia, alteration of the voice, and croupy respiration; sometimes there are other hysteric symptoms, sometimes none.

Barking Cough.—This is occasionally accompanied by a mucous and slightly bloody expectoration; it continues night and day, and may produce great debility, if not relieved. It has often a mixed character. Sir C. Bell relates a case of this kind, in which the hard bark came on at the rate of ten times in a minute; in the intervals the patient would cough naturally. The affection continued a month, and returned in three successive winters. Sir Charles gives other curious cases of coughs in young females; and remarks that "the ovaria are the source of irritation, and the consequences are exhibited through the most susceptible system of nerves, the respiratory."[n]

Grating Cough.—This species is easily distinguishable from the preceding, as it evidently originates in the pharynx; like the barking cough, it is accompanied by an expectoration which is thin, somewhat limpid, and occasionally tinged with blood.

[n] CXXXI. p. 99.

Treatment of Hysteric Coughs.—These curious affections are most readily relieved by moral means. Dupuytren found it useful, in an analogous affection, (hiccup,) to prescribe the actual cautery in the hearing of the patient.[o] Dr. Williams successfully removed a most uncontrollable hysteric cough, which produced great debility, by the same means; and a similar cough, in a remarkable case which I have related elsewhere,[p] was much alleviated in the same way. Cold affusion, belladonna, stramonium, &c., the metallic tonics,—as iron, arsenic, zinc, bismuth,—and change of air and scene, have all been recommended. One patient alluded to by the Messrs. Griffin,[q] had three attacks: the first was cured by a mild course of mercury, after a useless trial of purgatives, leeching, blistering the spine, tonics, &c.; in the second, quinine and cicuta were successful; in the third, which followed mental depression, no medicines were given; no notice was taken of her complaints; she was allowed to go into company, and mingle in general amusements, &c.; and in less than a week she was perfectly well. It is plain that the treatment must vary with the causes; morbific moral agencies must be counteracted by moral treatment; depleting agencies, by strengthening; the arthritic, by the means recommended.

Alterations of the Voice.—I need only refer the reader to my previous remarks in the physiological part, (59,) as an introduction to this set of symptoms. The muscles, mucous membrane, and probably the tendinous structures, are the organs implicated.

Aphonia.—This, of all the symptoms affecting the voice, is the most frequently met with in hysterical females, and is dependent upon paralysis of the laryngeal muscles. It may be briefly stated that aphonia supervenes on all the causes of hysteria, and generally suddenly; is sometimes permanent, sometimes periodic, occasionally alternating with other paroxysms of the respiratory muscles,—as hiccup, ejulation, &c. When permanent, the patient can speak in a whisper, and at one time more audibly than at another; or the aphonia will disappear as suddenly as it came on, especially if a

[o] XIV. i., p. 550. [p] VII. xlix., p. 80. [q] LXXXVIII. p. 244.

strong moral influence have been exercised over the system. It may be intermittent, and has been observed as a double quotidian.[r]

Weak Voice and Hoarse Voice.—A weak voice is common in delicate young ladies with spinal curvature, cough, asthma, or other affection of the respiratory system; hoarse voice, or a strong voice, is most frequently met with in fat women, in whom the embonpoint evidently depends on ovarian irritation, or in slightly bearded females. Dr. Graves has described a peculiar alteration of the voice which occurred in a female, and was accompanied by uneasy sensations, as dependent upon neuralgia of the larynx. The affection recurred in paroxysms, and was rendered quotidian by large doses of the carbonate of iron.[s]

Hoarseness.—A catarrh, or other inflammatory affection of the larynx, occurring at or about the menstrual period, will often pass away, leaving this as a permanent symptom; it also sometimes follows, sometimes precedes aphonia, &c., and seems as unmanageable as the rest.

Treatment of Alterations of the Voice.—Little can be said respecting the treatment of these affections, more than that they must be treated on general principles, for little more is known. Sometimes aphonia has been apparently dependent on the irritation excited by a *dens sapientiæ*,[t] when galvanism has cured the patient. Aphonia, following a cold in a nervous female, has been removed by inhaling ammoniacal fumes. Dr. Gerner, the attendant in this case, prescribed as follows:—"℞. Ammon. muriat. ʒii, sodæ carbon. ℈ii. Let the sal-ammoniac be first dissolved in boiling water, and then the kali be added to it; the water must be kept boiling, and the patient is to breathe the disengaged carbonate of ammonia through a funnel, once a day." She used it six times only, and her voice was quite restored. She was also entirely freed from a hoarseness to which she was subject.[u] Other stimulant gases might answer the same purpose. Aphonia has also been cured by balsam of copaiba.[v] Perhaps the moral means found

[r] CXXXVII. xxii., p. 41.
[s] XXXV. xiv., p. 372.
[t] CXXXVII. Zweite Supplement-Band. 1840, p. 92.
[u] Ibid.
[v] XV. i., p. 119.

useful in removing hysteric coughs, might be beneficial in aphonia and hoarseness.

SECTION IV.

CERTAIN SPASMODIC AFFECTIONS DEPENDING ON COMBINED ACTION OF THE RESPIRATORY MUSCLES.

SEVERAL of these have been already noticed in connexion with their supposed exciting cause,—as vomiting, asthma, sneezing, cough, &c. Now, although these may, and often do, originate in morbid sensibility of certain portions of the mucous membrane, supplied with sensitive nerves from the respiratory ganglia, yet, if we knew their exact pathology, we should perhaps have to class them with some analogous affections about to be noticed, and which manifestly depend upon irritation of those nervous centres in direct relation with the respiratory tract.

The most natural division of the last-mentioned is into two classes; the first comprising those directly connected with ideas or emotions; the second, those indirectly, or rather less directly, so connected. In the one will be laughter, weeping, sobbing, ejulation, ululation, yawning; in the other, hiccup, vomiting, anhelation, or panting, &c. It is evident at a glance, however, that these last in many cases may be classed with the former; for vomiting will come on from disgust, hiccup will supervene on sobbing, and anhelation may be caused by either pleasure or grief. I was consulted by a female who had panting respiration, without any perceptible cause, except long-continued inconsolable grief for the death of an only child. It was accompanied by profuse urinary secretion, (in fact, diabetes) insipidus, lachrymation, globus, and a most sorrowful expression of countenance; the action of the thoracic viscera was perfectly normal. For further illustrations of the connexion between these emotional phenomena, the reader is referred to Part II., chapter vi.

The remark may be made here, that there are some affections of the muscles of the face which might properly be

classed with the preceding; for the facial muscles enter into combinations varying, as the brain is affected by emotions, as distinctly as the respiratory. Compare the facial movements accompanying weeping, with those of laughter; how remarkably constant and distinct is the difference! These various combinations of the muscles supplied by the respiratory system of nerves, when influenced by the emotions, present a large field for curious and useful research. It appears to be as probable that there is a distinct centre for each emotion, as that there is one for certain distinct sets of muscles,—as the pronators and supinators, the flexors and extensors, &c.; how different, for example, is the whole combination in the two antagonizing passions of joy and sorrow.

Laughter.—This is a common accompaniment of the hysteric paroxysm, and of many forms of hysteria; but it will also occur singly, or with the general symptoms, in a very slight degree. The affection is sometimes intermittent, as are all of this class. The following case is from a French journal.

CASE XII.—A young female felt every day, precisely at two o'clock, a kind of epigastric cramp, which, in half an hour, was followed by a forced and loud laugh. This immoderate laughter continued eight hours, at the end of which time, a sweat came on and the fit ceased. Baths, bloodlettings, &c., were tried in vain; but a cure was ultimately effected by bark.

These cases of involuntary laughter do not seem rare: Schenk describes two in his Observations.[w] They seem to be in some way connected with the diaphragm. Hippocrates relates that "Tychon, in a siege at Datus, was struck on the breast by a catapulta, below the diaphragm. In a short time after he was troubled with involuntary laughter. He died on the third day."[x]

Weeping.—The same remarks are applicable to hysteric lachrymation as to the preceding. I have not, however, met with an instance in which it was intermittent, except as part of the hysteric paroxysm.

Sobbing.—This is often confounded with, and ends in, hic-

[w] Lib. i., Obs. 3, 4. [x] De Morbis Epidem. lib. v.

cup; but there is a peculiar form of it which may be termed "convulsive sobbing." It is exactly like that which attacks a person unaccustomed to cold bathing, when walking slowly into a cold bath for the first time. It appears to be analogous to the dyspnœa of the hysterical paroxysm, which it often precedes and follows; but it is as often observed in the chronic and aggravated cases of hysteria, quite distinct from a regular paroxysm.

Sighing; Ejulation.—There is, occasionally, a rare form of nervous affection observed, in which there is rhythmical sighing, or the repeated mechanical utterance of one or more syllables. Thus, in two instances of rhythmical chorea, in two young ladies, the choreal movements of the head and arms were accompanied by the words, "tic, tic," like a clock, uttered in accurate tune. They were sometimes insensible, sometimes sensible, and would say, "I cannot help it, but there is the tic coming;" and then they would go on with the sound. Occasionally they would utter distinct words, as, "I cum," or, "Hi cum, hi cum." Among several cases illustrative of the more novel forms of hysteria, Dr. Bright mentions one of this character, in which the spasmodic exclamations were "Heigh ho! heigh!" The former was uttered at intervals of three seconds; the latter, of two seconds.[y] Many persons, when in tolerable health, love to sigh somewhat musically; they will take a high pitch, half yawning, half sighing, and run down the gamut very regularly. I think the other form is some modification of this.

Ululation.—In those paroxysms of hysteria which resemble epilepsy, the patient will utter a loud cry, as if terrified (see page 187). This howling appears to be altogether automatic, and is probably excited when the causes of the paroxysms develope those changes in the nervous system which are caused by terror.

Yawning.—Occasionally excessive yawning, like excessive sneezing or laughter, is the principal symptom in a case of hysteria. Under the head of "Oscedo Hysterica," Sauvages states that Höchstetter and Riedlin relate cases of young

[y] V. Case 212.

females who, after suppression of the menses for a long time, experienced paroxysms of yawning at a certain hour every day; in one, the jaw was dislocated in consequence.[z] It is very common in almost every case of hysteria, and with nervous people in general. These last usually connect it with the flatulence they experience at the same time; so that when a fit of yawning comes on, old people say they are "windy."

Hiccup.—The same remarks are applicable to hiccup as to the other paroxysmal affections of this class. It has been observed to be intermittent, (230,) and to alternate with aphonia.

Anhelation, Panting.—These take place in various degrees, from merely quick respiration to a violent convulsive action, in which there is an alternate contraction and relaxation of the thoracic and abdominal parietes. I have already alluded to an instance of anhelation induced by grief. (See p. 284.)

Treatment.—Little need be said on this subject, as the treatment must be conducted on general principles. When any one of them occurs uncomplicated, cold affusion on the head and thorax, blisters to the neck and spine, and nervines, have been recommended.

[z] XI. i., p. 633.

CHAPTER V.

AFFECTIONS OF THE MOTOR SYSTEM IN GENERAL.

THE affections of this system present a number of phenomena differing exceedingly in character, although closely allied in origin. They may be arranged, for practical purposes, under three heads: the first comprising those in which there is spasm or paralysis without actual distortion; the second, those in which distortion follows cessation of muscular equipoise, as in the various forms of club-foot; and the third, the paroxysmal affections of the motor system. The last will be considered with paroxysmal affections in general. It may be remarked, that many in the two first divisions are often connected with, or the sequel of, violent convulsions.

SECTION I.

PARALYTIC AND SPASMODIC AFFECTIONS.

Hysterical Paraplegia.—More or less paralysis of the lower extremities is always accompanied by a corresponding degree of derangement in the functions of the pelvic viscera, as exhibited in constipation, tympanites, vesical paralysis, increased or diminished urinary secretion, ovarian and uterine irritations, &c. When the paralysis of the legs is incomplete, they are affected by choreal movement, or spasm.

The duration of hysteric paraplegia varies from a few days to several years. It is in the latter case that vicarious urinary discharge, fæcal vomiting, marvellous anorexia, and the other anomalous symptoms, have been most commonly observed.

There is generally abdominal and spinal tenderness, to a very great extent; and hence the difficulty some experience in ascertaining the true nature of the affection.

A female will remain confined to bed for many months, utterly unable to use the lower extremities, her medical attendant despairing of rendering her any benefit; when, upon any sufficient moral cause, she will suddenly rise from her bed, and walk as if nothing had ailed her, "no longer the victim of nerves, but the vanquisher," as Thomas Carlyle writes. This is one of the terminations of hysteric paraplegia, which will remind the physician of the danger of pronouncing any case of this kind incurable.

Diagnosis of Hysterical Paraplegia.—Sir B. Brodie remarks that "many instances of hysterical affections, in which the symptoms are referred to the spine, are mistaken for those of ulceration of the intervertebral cartilages and bodies of the vertebræ; and in consequence of this unfortunate impression on the minds of the medical attendants, I have known not a few, but very numerous instances, of young ladies being condemned to the horizontal posture, and even to the torture of caustic issues and setons, for several successive years, in whom air and exercise and cheerful occupations would probably have produced a cure in the course of a few months."[a] All this is quite true, but in what a melancholy light does it place the science of medicine! and how strongly does it prove the necessity of a thorough review of the nervous affections of the sex. The diagnosis will certainly not be difficult if the practitioner have made himself well acquainted with the general history of the complaint. The only symptom which would lead to a suspicion of intervertebral disease is the spinal tenderness. Now it is quite certain that tenderness of the vertebræ is not a sign of actual disease, either of the bones or of the membranes of the cord, and nothing is more absurd than to make it a diagnostic symptom, as is shown in the proper place. (See *infra.*) It may so happen that there may be a fixed hysterical pain in the lumbar region, with paraplegia, without the usual hysterical symptoms, but there is sure to be some symptom implicating the uterus, from which viscus in

[a] XIV. xix., p. 201.

fact the pain originates; or the countenance of the patient will present no traces of that wear and suffering which characterizes those having inflammation of the spinal meninges, or of the intervertebral cartilages; and when, in long-protracted cases of hysterical paraplegia, the patient begins to sink beneath her sufferings, it is in a manner *sui generis*, or at least obviously different from the hectic stage of articular disease.

Treatment of Paraplegia.—This must be conducted on general principles; there are one or two points, however, which require notice. The patient will be inclined to remain within doors, and to take no exercise; especially when the psoas and iliacus muscles are implicated in the paralytic affection, or the lumbar muscles are weak. It is both painful and difficult to maintain the erect position; and the patient, if allowed, would never move but from bed to the sofa, and back. Now a pair of crutches should be provided in this case, that she may swing about on them in the open air; she will dislike them at first, but this feeling soon changes. She should also be encouraged to drive her own carriage, so that the attention may be distracted from the weakness and debility of the back.

Salt water bathing of the spine, the douche and shower-bath, frictions of the legs and spine, with shampooing, should be persevered in. The tetanic spasms of the legs are best relieved by cold affusion. Any external remedy which makes an impression on the mind will be useful; so that it should be so contrived that all blistering and caustics may be applied in some novel way every time, but allowed to heal quickly, unless the arthritic diathesis be present.

With regard to the administration of internal remedies, these must vary with the accompanying symptoms. Dr. Seymour strongly recommends the gum asafœtida. In one remarkable case he prescribed one drachm of asafœtida, half an ounce of pimento water, and one ounce of lime water, to be taken two or three times a day, and the best effects resulted. It is of great importance to discover the cause of the disease: usually some one or more of the pelvic viscera are affected, probably the kidneys, uterus, or ovaria. Should

there be tenderness of the cervix uteri, leeches might be applied to it, to the vagina, or to the anus. Occasionally irritation of the cerebellum is the cause of the paraplegia, when blisters and leeches to the nucha are indicated.

Hysteric Hemiplegia.—When this occurs, it is usually as a consequence of some violent paroxysmal attack, or forms part of a paroxysm. In the one case it is permanent, in the other evanescent.

Paralysis of an Extremity.—Sometimes one leg will drag paralysed, sometimes an arm hangs helpless; sometimes it is only the wrist or a finger. All these affections are very fleeting, coming one day, going the next, and if permanent, requiring no special notice, since the principles of treatment are the same as for the preceding.

Chorea.—This affection is the link between paralysis and spasm, or, more properly, is the sum of the phenomena exhibited by the motor part of the nervous system as it passes from the one into the other. From its history given elsewhere, I have shown that it is the precursor of the hysteric and epileptic fit; and it is well known to pass, when inveterate, into the more complicated and the incurable diseases of the nervous system.

Chorea is characterized by a series of quick muscular catches or jerks which are really spasmodic; and volition is so far paralysed that (in common with many other agencies) it only acts as an excitant of these short spasms, rather than as a directing power. The more this paralysis is removed, the more able is the patient to control the involuntary or excito-motory movements.

It is evident that the term chorea is quite inapplicable to these movements; it is very rarely that there is any appearance of dancing, except when the gastrocnemii are principally affected, and then the movements are not trochaic or rhythmical. It is very different from the true chorea or St. Vitus's dance, (284,) and from the rhythmical chorea observed in tarantism, and in some nervous affections, as in Mr. Wood's case.[b] But, as I have noted its relations elsewhere, I need not here repeat them.

[b] XLV. vii., p. 238.

These spasmodic twitches may attack the whole body, or only one muscle or set of muscles; the half of the body, or only an extremity. The oscillation of the eye is choreal; and, as a proof of the above remarks, I may observe, that I knew a child with choreal oscillation of the eye, whose sister labours under a high degree of strabismus. Sometimes it is the muscles of the eyelids or of the cheek which suffer. I remember a case in which the patient had an up and down movement when upright, as if he were springing on his toes, from, apparently, an affection of the flexors of the leg.

The causes of chorea are those of similar affections: fright and imitation are the most common. Dr. Bright has observed it to be co-existent with rheumatism, of which he thinks it an effect, and also with roseola, urticaria,[c] and pericarditis.[d]

Treatment of Chorea.—Great stress has been laid upon the repeated use of purgatives in this affection by Dr. Hamilton, and many of his pupils; with this exception the treatment of chorea differs in no respect from that of its congeners. Since the alimentary canal is torpid, occasional aperients will doubtless assist the action of metallic tonics, which are certainly both the safest, most convenient, and best remedies. It is difficult to say which of these should have the preference; iron, I think, is the most eligible, both on account of its efficacy and convenience. Dr. Gregory strongly recommends the ammoniated iron,[e] Dr. Elliotson and others the carbonate. The oxide and sulphate of zinc, the nitrate of silver, salts of copper, and even arsenic,[f] have been administered with success. Dr. Addison strongly recommends electrifying the spine, especially the lumbar portion.[g] The shower-bath ought not to be omitted. Although chorea be essentially a disease of debility, it ought to be remembered that sometimes its exciting causes are of an active character, and require a corresponding treatment. When it has followed a fright, leeches ought to be applied to the nucha, gentle saline aperients administered, and a soothing hygienic treatment adopted, before having recourse to the preceding remedies.

[c] V. ii., p. 469. [d] XLV. xxiv., p. 10.

[e] Elements of the Theory and Practice of Medicine, 3rd Edition, p. 403.

[f] XLV. iv., x. xi. [g] LI. ii., p. 500.

Tetanus.—There are at least three kinds of tetanus to which females are subject. One species is analogous to epilepsy, and recurs, like it, in paroxysms. Mr. Lawrence mentions an instance of this kind, where the source of irritation was a painful cicatrix of the finger, and in which the fits assumed an intermittent type, being quotidian. Another form is of a chronic character, and gives rise to some of the deformities to be noticed in the next section. A third closely resembles traumatic tetanus, and is accompanied by quick pulse, hot moist skin, and great susceptibility of the surface and of the senses. There is a modification of this, in which the tetanus is connected with irritability of the pharynx or skin, and is present in cases of hysteria in the last stage of exhaustion.

Tetanus is closely related to, and excited by, the same causes as other spasmodic and paralytic diseases; it frequently precedes the latter, being, in fact, but a prior stage of the same affection. It often occurs at hebdomadal periods, particularly about the menstrual period, or after labour or abortion.

Treatment of Tetanus.—Cold affusion stands at the head of all the remedies for hysteric or idiopathic tetanus. Since it acts most probably as a sedative, (cold, rightly applied, is as much a sedative and hypnotic as opium,) the surface should be affused until thoroughly chilled; a less degree of cold will only increase the susceptibility of spasm; but there is obviously danger in applying it suddenly. Terebinthinate medicines and enemata, have been found useful; and metallic tonics, especially iron. The tincture of black hellebore has been administered with success;[h] would not colchicum be also useful? The treatment of that form which is dependent on exhaustion or intestinal irritation, need not be specially noticed, as it obviously must be conducted on general principles.

[h] VII. xiv., p. 405.

SECTION II.

DISTORTING AFFECTIONS OF THE MOTOR SYSTEM.

One form of disease passes so closely into another, that it is impossible to define them strictly. In the present instance it will be observed, that some distortions, specially noticed, are merely tetanic, while others are dependent on paralysis; but these affections are thus arranged with a view to practical utility.

a. Distortions of the Extremities.

Talipedal Distortions.—Every form of talipes has been observed in hysteria. In Dr. Little's recent work on Club-foot is a case of this kind.[h] The theory of their formation is obvious.

Contracted Knee and Thigh.—Occasionally the leg is spasmodically flexed on the thigh, and the thigh on the pelvis, in a very extraordinary manner. In a case mentioned by Sir C. Bell,[i] the great toe was close to the anus, and the ligament of the knee-joint was endangered. In the same patient, shortly before, the thigh was close upon the abdomen. In a case seen by Mr. Shaw, a young lady, who had suffered from a train of symptoms apparently hysterical, had the ancle so turned round, that she walked on one side of her foot; and the knee was bent outwards to such a degree, that the external lateral ligament was nearly an inch longer than natural. Her spine was also becoming distorted. A consultation was called, and the senior consultant plainly declared that the patient was cheating them. By attention to the limb, in twelve months there was scarcely any lameness apparent.[k] The same author mentions a similar case in the same work.[l] Dr. Wilson has related some instructive cases of this description.[m]

[h] A Treatise on the Nature of Club-Foot and Analogous Distortions. 8vo. London, 1839. Case 25. See also LXXXII. App., Case 177.

[i] LXXXII. App., Case 176.

[k] CXXXIII. p. 185.

[l] P. 193.

[m] XLV. xxi., p. 123.

High Hip.—Paralysis of certain of the muscles of the pelvis, as the psoas, iliacus, and lumbar muscles, originates a peculiar shortening of the limb and incurvation of the spine. (See *infra.*)

Distorted Hand.—Permanent distortion of the upper extremity is not common. I have seen one case in which the biceps was contracted, so as to flex the elbow and supinate the radius; the hand was drawn over the wrist by the flexor carpi radialis. In a young idiotic girl, with a similar contraction of the wrist, (she had talipes varus on the same side,) I divided the tendon with an advantageous result.

Treatment of Distortions of the Extremities.—Mr. Strafford read a paper to the Royal Medico-Chirurgical Society on this subject, in which he recommended the use of counter-irritants to the spine and of mechanical extension, illustrating his views by cases. Dr. Wilson and Mr. Arnott both bore testimony to the efficacy of the cold douche to the affected limb; placing the patient in such a position, as to rest entirely on the uncontracted extremity, and afterwards making her walk about on crutches. Dr. Wilson had seen cases, in which the heel was against the buttock, yield to this treatment. In the less chronic cases, especially those connected with moral causes, both the flexors and extensors are affected; so that if the latter be resisted by manual extension, the extensors will contract so soon as the limb acquires a certain position, and carry it in the opposite direction. But the flexors are generally the most powerful, and most usually alone affected; so that mechanical means will be necessary to assist the extensors in maintaining the limb in proper position. The same general treatment must be adopted as for paraplegia and tetanus, and be directed against the cause of the disease.

b. Distortions of the Spine.

Scoliosis; Lateral Curvature.—In the fiftieth volume of the Edinburgh Medical and Surgical Journal, I advocated (with many previous authors) the doctrine that lateral curvature depended upon unequal muscular action. I remarked also: "Contrary to the common opinion, I conceive that the

muscles of the right side are the strongest;[m] those of the left being affected with partial paralysis, and so rendered unable to resist the greater force of traction to the opposite side. In accordance with this explanation are the facts mentioned illustrative of the greater liability of the left side to disease, the natural curve of health, and the pathological researches of Mr. Shaw, who found the muscles on the convex or right side to be the strongest, and the nerves going to the concave or left side diminished to less than one-half of their natural size.[n] The treatment, then, which directs shampooing and other local remedies to the right side, as the weakest, is not only useless, but positively injurious."[o] I had previously stated, that the curve was almost invariably to the right side.[p]

After I had prepared for the press the article from which the foregoing extract is taken, I met with a review of Professor Stromeyer's brochure on Lateral Curvature,[q] in the fifth volume of the British and Foreign Medical Review. I referred to it in a foot-note, and procured the work in consequence; but the views he advocates are so important as respects a right treatment of these affections, and so completely in harmony with and confirmatory of my own general views, that I must place them briefly before the reader, recommending to his perusal, however, the accurate review above mentioned, to which my notice of the work must only be considered as supplementary.

Professor Stromeyer remarks in his preface,—" I was led to the publication of this little work by the discovery that lateral curvature of the spine (scoliosis) was induced by paralysis of those respiratory nerves which supply the external respiratory muscles. Both study and observation led me to this discovery, and the correctness of this new view may be easily ascertained if the flat hand be pressed so against the abdomen as to hinder the movements of the diaphragm, and thereby throw the muscles of inspiration into increased action; in a case of lateral curva-

[m] The opinion, I ought to state, of Morgagni and Boyer, as well as of other writers.

[n] CXXXV. p. 68.

[o] VII. l., p. 336.

[p] Shaw, op. Cit., p. 58; CXXXIV. p. 42. See also paragraph 314.

[q] CXXXVI.

ture the muscles on the concave side will be found deficient in energy. In many cases of scoliosis, especially of delicate children, it may be observed during the ordinary respiratory movements that the concave side is drawn inwards by the diaphragm, instead of upwards and outwards by the external respiratory muscles."—Page 5.

The following case will well illustrate the views of the author with respect both to the pathology and treatment of scoliosis. It is entitled "Paralysis of the External Inspiratory Muscles of the Right Side."—Page 1 :—

CASE XIII.—A girl aged eleven years, whose mother had died of consumption, came under my care on the 9th of August, 1834, for lateral curvature. In her infancy she suffered from head-ache and the tape-worm; from her eighth to her tenth year she had, at intervals, intermittent fever, and latterly a most obstinate diarrhœa. When this ceased (in August 1833) she had occasional hæmorrhages from the nose. In the January following she attended at a funeral, and on returning home was alarmed at the sight of the leeches which were being applied to her father. She immediately fell into a curious magnetic [somnambulistic] sleep, which at first continued a whole night, but subsequently for shorter periods, until it continued for fifteen minutes only. The fit returned almost every night, but particularly upon any mental emotion, or when she took cold. During the sleep she discoursed solemnly, spoke much of death, sung at intervals, or laughed. Her conversation was interrupted by speaking to her, but she did not awake; if she was touched she became silent and wandered about. After this she was attacked by a catarrh, and her aunt then first discovered that the left shoulder was higher than the right.

The patient appeared healthy and well-formed; and at a first glance from before, no deformity could be detected; but on looking at her back the difference in the height of her shoulders was very obvious. On further examination the inferior angle of the right scapula was found depressed beneath the tenth rib, and about an inch distant from the spine (normally this angle corresponds to the eighth rib); while the corresponding angle of the left scapula was drawn up to the sixth rib, and in consequence its upper part was drawn over the first ribs towards the anterior surface of the thorax, and so causing the lower part to project.

A slight lateral curvature was also observable, the convexity being to the left side with secondary curvature in the lumbar and cervical regions. When the patient bent forward the curvatures were removed, probably by the action of the longissimus dorsi, showing that neither the bones nor cartilages were displaced.

The position of the ribs was also altered. Those of the right side formed a more acute angle with the spinal column than those of the left; the latter, at their greatest convexity, were drawn upwards and backwards by

the trapezius and serratus magnus; but on the right side these muscles failed to counterbalance the action of the diaphragm, which drew the ribs on that side forwards and downwards.

When the right arm and scapula were raised to their normal height, the left was somewhat depressed, and a slight pressure sufficed to restore it to its proper position. It rose again, however, if left to itself, but most when the right arm was allowed to fall quickly; when this was done, slight contractions might be observed in the left trapezius, but the right scapula fell, as if lifeless, borne down by its own weight. But although there was a difference of four and a half inches in the height of the two scapulæ, there was only one inch and a half between that of the two acromia. This may be easily explained; for since the first ribs are not moved by the serratus, and were kept in position by the scaleni, they maintained the clavicles at a proper height.

Instead of being parallel with each other and with the spine, the posterior borders of the scapulæ formed deeply converging lines. The occipital origin of the left trapezius was strongly marked, while that of the right could not be felt.

Anteriorly the sternum was drawn to the left side, the right half of the thorax was depressed, the left half elevated. The two halves, measured across the nipples, differed half an inch in measure. The right clavicle was close to the first rib, its acromial end lower than its sternal end; but the left was placed just the contrary, its acromial end being elevated, while the sternal end was somewhat raised from the rib by the united action of the sterno-cleido-mastoid muscle and the elevators of the scapula. The head was drawn to the left side by the first-mentioned.

The patient had every voluntary movement of the scapula; the trapezius of the right side contracted distinctly when she lifted her shoulders, but the right scapula remained lower than the left. When she took a deep inspiration the depressed (the right) half of the thorax was raised, but the serratus magnus did not co-operate in the movement. The arms were of equal power; the voice was unaltered; she could walk quickly or upstairs without coughing.

When the patient was at first lifted from the ground, the scoliosis disappeared, but not subsequently.

Stromeyer goes on to state: "On the supposition that the nervus accessorius (one of Bell's respiratory system) was paralysed, all the preceding phenomena can be easily explained. The trapezius, sternocleido-mastoideus, levator anguli scapulæ, and the rhomboidei, would, in this case, take no part in the movements of inspiration, and the scapula would fall as low as its attachment to the trapezius would permit it, namely, to the tenth dorsal vertebra. The serratus magnus would consequently lose its fixed point of attachment, and so be unable to act on

the ribs, which would therefore be drawn downwards and inwards by the unbalanced action of the diaphragm ; while the antagonist muscles on the opposite side would carry the scapula backwards and upwards, and the ribs outwards and downwards, thereby causing the convexity of the left side. The trapezius of this side would act on the spinous processes of the vertebræ, but its action, unbalanced by the opposite trapezius, would in some degree be counteracted by the longissimus dorsi and multifidus spinæ, so that the corresponding vertebræ would turn on their axes, as it were. The other curves would necessarily follow the curve thus caused in the dorsal region. The wry-neck depended evidently upon a slight degree of paralysis of the sterno-cleido-mastoid muscle. The sternum would of course follow the dragging of the ribs to the left.

" The only real difficulty there is to get over, is to explain how it was that the inferior angle of the right scapula followed the direction of the inferior fibres of the trapezius, and was not drawn by the serratus magnus. But the difficulty vanishes by supposing that the posterior thoracic nerve which supplies the serratus was affected in like manner as the accessory ; and this, as will subsequently appear, was the fact.

" Having thus established the diagnosis, the treatment was easy. A tepid bath was to be taken in the morning, and cold douches to the trapezius in the afternoon. The paralysed muscles were electrified. During the two first applications of the cold douche the deformity vanished, and this also occurred during the first time the patient was electrified, but not afterwards ; although the scapula was somewhat raised at each time. On one occasion the same result followed, namely, when one pole was applied to the point at which the accessory nerve pierces the sterno-mastoid, and the other to the lower portion of the trapezius ; the curve also disappeared when the patient first attempted gymnastic exercises. [Doubtless the stimulus of mental excitement acting on the respiratory system (*272*) was the beneficial agent.] The patient slept on the inclined plane, and also remained on it for six hours during the day: when up, the right scapula was supported by a bodice. The medicine she took was ten grains of the carbonate of iron three times a-day. The best results soon followed

this plan of treatment. In six weeks the difference in the height of the inferior angles of the scapula was reduced from four and a half to two and a half inches, and this disappeared suddenly on the 26th of November, when I opened a new room for gymnastic exercises during the winter. The only deformity remaining was the depression of the right half of the thorax, and the consequent slight sinking of the corresponding scapula. I concluded from this that the serratus magnus was now alone affected, and I directed my attention more particularly to it. By means of gymnastic exercises, and the application of the liquor ammoniæ causticus[r] to the serratus, this remaining deformity was removed."

The patient had subsequently two relapses in the spring of 1835; one for forty-eight hours from a strain, the other for three days from a cold. A few warm-baths and a weak infusion of valerian restored the shoulder to its natural position. During the following summer her general health was strengthened by cold bathing.

Case XIV.—*Paralysis of the Serratus Magnus of the Right Side.*[s]—Dupuytren sent a young Irish lady to Amoros, to be treated in his orthopœdic institution. The right side of the chest of the patient was much less developed than the left, the right arm was weak, and there was a slight lateral curvature of the dorsal spine to the left. The true ribs on the right side were drawn inwards, those of the left outwards; the respiration was laborious, the inspiratory movements being urgent, and the expiratory almost convulsive.

Amoros directed the patient to speak and sing as loud as possible, to ring, to draw herself up with her right arm, to play at ball and throw javelins with the right hand, the weight of the former being gradually increased. In three months her breathing was regular, her voice stronger, and in other respects she was quite well.

Professor Stromeyer's opinions and practice with respect to spinal curvature are embodied in the preceding cases and remarks. But he does not take a one-sided view of the subject, and invariably attribute the distortion to debility and paralysis of the respiratory muscles; for he dedicates a chapter (the 8th) exclusively to the other causes. Further, he strongly draws

[r] The formula given for this at page 143, is R. Liq. ammon. caust. ℥i. spir. vini rect. ℥vii. M.

[s] Broussais' Annales, May, 1834.

attention to the marked distinction between the two functions of the respiratory muscles, the one being that of voluntary motion, the other of involuntary; or, in accordance with the views of Dr. Hall, they receive both true spinal and cerebral nerves. He thinks that the powers of the muscles on the two sides are unequal in voluntary movements; that is, the right-side muscles are more powerful than the left; but that they are equal in involuntary action. I think I have elsewhere advanced sufficient grounds for a different opinion. He refers to the fact that during violent paroxysms of hysteria the patient can draw a deep breath at will, proving that the functions of the lungs and the voluntary powers are intact, and also to the influence of the passions on the respiratory muscles, the exciting emotions, as joy, dilating, while the depressing, as sorrow, constrict the chest, even to suffocation. (276.) The muscles which he demonstrates to be principally affected in scoliosis are the sterno-cleido-mastoideus, the trapezius, levator anguli scapulæ, the rhomboidei, the scaleni, and the serratus magnus. He has one unintelligible remark, however, respecting the latter: he says—"The voluntary motion of the serratus seems highly problematical; from repeated examinations in muscular men, I am of opinion that the serratus is passive in the movements of the scapula."[t] This may be quite true, because one of the offices of the serratus must be to fix the scapula, as in climbing, &c.; but it is contrary to all analogy to suppose this large and important muscle not under the control of the will.

The reader will observe, as being in favour of the truth of Professor Stromeyer's views, that the general principle is involved in the doctrines I have advocated in this book, and yet worked out by a method totally different. It will be at once seen and acknowledged that the greater frequency of scoliosis amongst the sex may be in part attributable to their peculiar and foolish clothing; but there are hundreds of cases which have occurred independently of any tight lacing, and which must rather be ascribed to the deficient thoracic developement of women, which, while it exempts them from sthenic diseases,

[t] CXXXVI. p. 73, note.

renders them peculiarly liable to the asthenic, as phthisis, scoliosis, &c.

Treatment of Lateral Curvature.—It is of importance to ascertain exactly what muscles are paralysed, and whether the bones are distorted secondarily and permanently. Stromeyer's mode of investigation may be learnt from a perusal of case XII. and the subjoined remarks. It is simply to deduce the state of the muscles, 1. from the state of the bones, which is ascertained by ocular examination; 2. from their action in excited respiration; as when the diaphragm is impeded in its movements by pressure on the abdomen, or during laughing, coughing, dyspnœa, &c.

With regard to the secondary distortion of the bones, it is certainly not common; for in the vast majority of cases the curve is removed by causing the patient to stoop forward, or to hold herself upright. The numerous cases of inveterate talipes which have been treated by tenotomy, and the foot restored to its normal position, prove how little effect irregular muscular action has in inducing permanent or incurable distortion of the bones. Restore the muscles to a balanced action, and the bones return to their proper position.

It is obvious, then, that for the mere purpose of replacing the distorted vertebræ, the patient need not be confined to her back; but as the weakened muscles suffer still more from over-exercise, it will be well to direct the patient to recline when not taking exercise. As for lying on a board, that is manifestly unnecessary; a firm mattress will serve equally well for all the purposes of the hygienic part of the treatment.

When the recumbent posture is necessary, Professor Stromeyer advises the plan recommended by M. Pravaz of Paris, who places his patient in a hammock, on the side corresponding to the convexity. The displaced bones are thus exposed to pressure, and the respiratory muscles of the concave side are excited into action from the restraint placed on those of the opposite side; while, in addition, the patient performs various gymnastic exercises with the weak side. A hole made through the hammock, leaves the right arm at liberty for any employment; for it is of great importance to divert the patient's mind.

The affected muscles having been ascertained, local remedial treatment should be directed to them, as the douche, shampooing, friction with stimulating liniments; the spine should also be slightly counter-irritated; and the tone of the whole respiratory system, as well as of the affected muscles, increased by suitable exercise.

The late Mr. Wilson, in his lectures delivered at the Royal College of Surgeons,[u] acknowledges his obligations to Mr. Grant, of Bath, for the first hint he received of curing lateral curvature of the spine by the regular and uniform action of the muscles belonging to it. "In an accidental conversation, he informed me that he had proposed to cure these affections by placing a weight on the head of the patient, on the principle of producing frequent and equal action of the vertebral muscles. His plan of treatment immediately struck me as being founded on just physiological principles; and I told him that I had then a favourable opportunity of beginning a trial of it. On that very day I began the trial; and the event, in three weeks, exceeded my most sanguine expectations of success. I have adopted the practice in very many instances during the last sixteen years; and in no instance, where it was properly persevered in, have I found it to fail in preventing the further progress of the disease; and in many, I have witnessed it effecting a perfect cure; at least, so perfect, that no perceptible deformity remained, nor was any inconvenience in other respects suffered."[v]

Mr. Wilson recommends that the weight be used in the following manner:—A small footstool, covered with a flat cushion, being inverted, may be placed on the patient's head; the hollow between the feet of the stool will allow of some substance, varying between four and ten pounds' weight, (for it may be necessary to increase it to the last amount, although much less is generally sufficient,) to be placed in it. The patient should be instructed to raise this footstool with both her arms, and place it on the crown of her head, elevating the spine, at the same time, towards the stool. Then preserving as erect an attitude as possible, she should walk in a straight

[u] CXXXII. [v] Ibid. p. 53.

line (as soldiers are taught to march) for a time not exceeding ten minutes; and this should be repeated occasionally during the day. A flat round bag of leather, or other tolerably strong material, may be filled with pebbles, shot, rice, &c., and will serve the purpose equally as well as the stool.[w] There are various other contrivances for coaxing the patient into active exercise; as swinging by the hand of the weak side from a cross stick attached to a rope; playing at archery, or throwing the javelin; or at fives, &c. Active domestic employments are very useful. When the patient is weak, crutches are beneficial; for they not only take the strain off the spine, but excite the serrati into action, these muscles contracting to fix the scapula—which is precisely the object gained by the swing. At an institution which Dieffenbach visited when at Paris, he saw numbers of young ladies on crutches, some chatting in groups, others flying about the grounds with amazing rapidity. Such a plan must be much less fatiguing, as well as much more agreeable, than swinging by one hand. Professor Stromeyer very correctly remarks, "The exercise must be of such a kind as shall give the patient pleasure, and not pain. Binding the right arm down, with the hope of compelling the left to be more freely used, must be very annoying. Varied gymnastics, performed in company with others, are most useful; partly because the patient is induced to continue them for a longer time, and partly from the great delight they give her."[x]

These means are recommended for the purpose of bringing up the weakened muscles to the *par* of health; but there are some who have recommended, and even practised, a contrary plan—they have divided the muscles of the convex side. This method has sprung out of the admirable mode of curing club-foot by tenotomy. It *appears* somewhat barbarous, and there are not many cases in which it would be absolutely necessary. It is, however, but fair to Dr. Guerin to state, that, in the twelve cases in which he operated with success, the distortion was such that the usual means were of no avail. In all the cases there was no more pain or annoyance experienced than

[w] CXXXII. p. 55. [x] CXXXVI. p. 134.

in the more common tenotomical operations.[y] (Since writing the above, I have divided the trapezius and rhomboid muscles, in a case of lateral curvature to the left side. The patient was a young gentleman aged eighteen, and the distortion was very great. I operated on the 11th of September; on the third day the wounds were cicatrized; on the fourth, he was walking about as usual, having experienced no pain or indisposition whatever. In operating, I pinched up a fold of skin over the muscles; slipped a long, narrow curved bistoury under it to the hilt, and then, without letting the fold of skin drop, turned the edge of the bistoury to the muscles, depressed the point, and cut about an inch and a half out; I then allowed the fold of skin to fall, and finished the incision. Two were required. I could feel the retraction of the muscles, as they were divided, very distinctly. Arterial blood flowed freely from the punctures; but on compressing them with a pledget, the hæmorrhage ceased instantly and entirely. An elastic swelling immediately occupied the line of the incisions, formed, no doubt, by effused blood; and subsequently this part appeared yellow, as if it had been bruised. The patient scarcely complained. Judging from my own experience in myotomy and tenotomy, M. Guerin's observations are highly worthy of attention, and I have no doubt are correct.)

Other remedial means should be conjoined with the preceding. Suitable mechanical means should be adapted to the deformed ribs and spine, and medicine exhibited according to the state of the patient. The metallic tonics, the cold bath, and the shower-bath, sea-bathing, and the various means calculated to benefit the general health, are indicated.

Chicken-breast and Flat-breast.—Professor Stromeyer says that the pectoral muscles, being destined to preserve the arch of the chest, occasion chicken-breast when not counterbalanced by the serrati. When they are deficient in energy, the thorax assumes a flat form, increasing in lateral diameter; and the diaphragm and triangularis sterni drag the sternum inwards. The supra-spinatus, infra-spinatus, and subscapularis seem set apart for communicating tension to the pectoral

[y] XXXVII. viii., p. 554.

muscles. The diaphragm contributes to the formation of the distortion. The facial horizontal position is recommended in this affection by Mr. Bampfield.

Lordosis—Bow-back.—When the longissimus dorsi and sacrolumbalis of both sides are paralysed, they cease to antagonize the psoæ, which consequently drag the vertebræ forward. When paralysed on one side only, or when one psoas is paralysed, there will be lateral curvature and high-hip. The following case related by Stromeyer will, I think, interest the reader.

Case XV.—An unmarried lady, aged thirty-one, had neuralgia on the inside of the right knee-joint, and slightly on that of the left. She suffered at the same time from general indisposition, which her physician termed a nervous fever. After being confined to bed six weeks, she recovered, but found that her right leg was three inches and a half shorter than the left; to remedy this defect she had a high-heeled shoe made. Dr. Stromeyer being called into consultation, found that when the patient was supine, the leg was only one inch too short, and by a little stretching could be made as long as the other. When she stood erect, the right hip was drawn up, there was a slight curve in the lumbar region, and the vertebræ were drawn strongly forwards, so that the belly was protruded, and the upper part of the trunk drawn strongly backwards, and to the right side. The patient could relieve the lumbar bend in some degree by an effort; she could also stoop forward, but raised herself with difficulty; her gait was tottering; the right hip was manifestly raised at every step; and the high-heeled shoe seemed of little use. She still felt the neuralgic pain, especially during changes in the weather.

I considered this deformity to be dependent upon paralysis of the sacrolumbalis and longissimus dorsi muscles, but most on the right side. Hence the psoæ were not antagonized, and drew the lumbar vertebræ forwards, [might they not be affected by spasm?] while the right psoas drew also upon the femur, and so raised the hip.

I recommended the application of the actual cautery, but the patient would not consent to its use. Stimulant liniments and medicines did little good. Her attack commenced in autumn, 1833; and in the following summer she took sulphureous baths and douches, which had a bad effect on her health, and brought on a spitting of blood. While being douched on the 7th of July she felt a sudden pain in her back, and was unable to step out of the bath. She was carried to bed, and it was found that the legs were of equal length. Subsequently the lumbar curve, both forwards and laterally, almost altogether disappeared, and the patient recovered the power of locomotion, but her gait continued weak and tottering.[z]

[z] CXXXVI. p. 53.

The only valid objection to the doctrines of Stromeyer is, that he attributes too much to paralysis or debility, and little or nothing to spasm. Now spasm, in cases of hysteria, is the state preceding paralysis, and some of these deformities may thus originate, as in the next species.

The dorsal horizontal position is recommended in lordosis or incurvation, and the facial in excurvation.

c. Distortions of the Head and Face.

Torticollis; Wry-neck.—This may be either acute or chronic. The chronic form is analogous to lateral curvature, being dependent upon palsy, usually of the left sterno-mastoid muscle. In acute torticollis the spasm is tetanic, the trapezoid is affected as well as the sterno-mastoid, and even other muscles of the face and neck. The head is drawn to the affected side in the acute form, to the unparalysed in the chronic. Dr. Hutchinson of Nottingham, who has well described the disease, says: "The spasm is attended with considerable pain and apprehension; so much so, that the patient dreads walking, and when moving about, supports his head with his hand placed on the occipital region. During the day the spasmodic action is constant, but intermits at night; the sleep is tranquil, but if broken, the spasms recommence."[a] Sometimes the spasms are not well marked, and only occasional. These cases, if not relieved, become chronic in consequence of one of the sterno-mastoid muscles yielding to its more powerful antagonist; and in time, according to Sir C. Bell, the contracted muscle degenerates into a tendinous structure.

Treatment of Torticollis.—This differs in no respect from that of the preceding. Its causes are various, and must, if possible, be discovered. Sir C. Bell cured one case by attending to the state of the stomach, and giving the trisnitrate of bismuth.[b] The local means recommended for lateral curvature should be adopted; and, if necessary, the contracted muscle should be divided,—a mode of treatment recommended more than half a century ago.[c]

Facial Paralysis.—This is an affection which, when depen-

[a] XXX. 1836-7, i., p. 22. [b] LXXXII. p. 425. [c] CXXVII. p. 461.

dent on functional disease, supervenes on exposure to cold, or on repeated convulsive paroxysms.

Distorting Affections of the Muscles of Expression.—The muscles of the eyes, face, and neck are sometimes affected with most singular convulsions, constituting hideous or comic combinations. Some very interesting examples are related by Sir C. Bell.[d] The head moves in every possible manner; the lips, cheeks, and nose are thrown into the most remarkable contortions; the eyelids open and shut, the eyes stare, squint, and roll about with inconceivable rapidity. Sometimes the affection is confined to one, two, or three muscles, as when the levator palpebræ is paralysed in ptosis, or the recti muscles affected in tetanus oculi, or the masseters in trismus. In one case related by Sir T. Moriarty,[e] the masseters were paralysed, and the lower jaw hung upon the chest. Occasionally it was dashed against the upper jaw by spasmodic action. In this case, pressure on the inferior maxillary branch at its exit from the mental foramen relieved the symptoms, and the patient wore a silver coin constantly bound on the spot. I remember an instance of chronic trismus in which the jaw was firmly closed, and which I have no doubt would have been relieved by division of the masseter muscles. It resisted all the usual remedies.

[d] LXXXII. p. 412, seq.

[e] Trans. of the Coll. of Physicians in Ireland, vol. iv.

CHAPTER VI.

PAROXYSMAL DISEASES.

THERE is great variety in the paroxysmal affections of the nervous system of females. The paroxysm may be local or general, may implicate both the motor and sensitive system, or may be confined to one of these. The greater number of the local paroxysmal affections in which the viscera are peculiarly implicated have been already reviewed; neuralgic paroxysms will be noticed elsewhere; so that the paroxysms of the system in general need alone be treated of at present.

I have already discussed the pathology of these diseases, (288, seq.,) and have attempted to show that the cerebellum, corpora quadrigemina, and medulla oblongata, are the parts of the nervous system principally affected. If we were hypothetically to consider paroxysmal diseases as but different phases of one pathological state of the nervous system, its source may be traced to the nervous centres mentioned, either downwards from the convolutions of the hemispherical ganglia, or upwards from the respiratory ganglia and their connected nerves. (200.) Commencing with the latter, we have, first, the paroxysmal affections of the thoracic and abdominal viscera, then spasm and paralysis of the muscles of the chest, larynx, neck, and face; ascending to the cerebellum, irritation of its surface (199) may be the cause of the phenomena peculiar to the hysteric fit; of its interior, the cause of chorea, epilepsy, and convulsions; irritation of the tubercula quadrigemina is followed by disease of the cerebral nerves, trochaic chorea, motions in a definite direction, and of antagonizing sets of muscles, vertigo, and its modifications; and lastly, deli-

rium, spectral illusions, somnambulism, and fatuity, show the affection, in its progressive march, ultimately deranging the functions, and probably the molecular structure of the hemispherical ganglia. It is by no means intended to advance that such, in general, is the actual progress of these affections, because the irritation may be arrested in one particular portion, or only implicate those portions of the central axis which, from the operation of causes acting peculiarly on them, are brought below the *par* of health. But certainly there are cases in which the progressive evolution of these symptoms may be traced through the convulsions, croup, laryngismus, &c., of infancy, to the final developement of the higher forms of disease.

Hysteric Fit.—The slightest paroxysm consists in a sense of constriction of the throat, increased urinary secretion, and flatulent distension, showing that the mucous tissues only are affected. In a higher degree these symptoms are accompanied by a dull sensation in the hypogastrium, sense of strangulation, and of a ball ascending up the throat; there is a feeling, too, as if an iron ring were round the false ribs (spasm of the diaphragm ?). In a still severer form, there are rigors, coldness, convulsions; and in the most severe, abolition of consciousness, irregular pulse and respiration, and often symptoms of actual death. According to Georget, when consciousness is abolished during the paroxysm, the convulsive movements are more violent, resembling those of epilepsy. Several hours before a paroxysm, or even for some days, the patient feels the limbs to be heavy, has rigors, is cold, anxious, and impatient; and feels a desire to leap, run, walk, &c. Although the paroxysm be in general of an epileptic character, it will still often assume that of the common hysteric fit. Voisin mentions a case of this kind,[f] in which there was sometimes hysterics, sometimes epilepsy, sometimes only loss of consciousness.

Diagnosis of the Hysteric Fit.—There can be little difficulty in distinguishing the common hysteric paroxysm from epilepsy, if the general history be well considered. It may be observed, however, that in epilepsy the muscles connected

[f] CXXIV. p. 227.

with the respiratory tract are affected, especially the facial; the respiration appears for a time entirely suspended, and the patient is like one hanging, the face being tumefied, the lips livid and foamy. The loss of consciousness is complete; a state in most cases depending upon the same state of the encephalon as that which induces the convulsions, but in some, upon closure of the glottis, and the consequent derangement of the cerebral circulation. In the hysteric fit the face is often suffused, the facial muscles are not convulsed, and the laryngeal but slightly, so that there is no foaming at the mouth, nor loss of consciousness.

Epilepsy.—When the hysteric fit changes into the epileptic, the paroxysm is not well defined, being mixed up with leipothymia, tetanus, catalepsy, somnambulism, &c. In using the term epilepsy, it must be understood to have a very extensive application. Partial convulsions, as of one arm or leg, are called epileptic, (Boerhaave,) although they occur without loss of consciousness or subsequent coma, simply because they precede the true fit. For the same reason leipothymia has been considered epileptic; it is a symptom frequently concurrent with deranged stomach and bowels. I have known it excited by laughter: the man subject to it could never have a hearty laugh without an attack of faintness, vertigo, and mental disturbance. Epilepsy may be also partial with respect to the class of muscles involved in the spasmodic movements. In the genuine and common form, there are violent involuntary and alternate contractions of all the muscles of the body; but if the contraction affect the extensors only, and is not alternate, but continuous, we have catochus; if the flexors, tetanus, &c.

Epilepsy, *mutatis mutandis*, is precisely analogous to other paroxysmal affections. In most cases, mental emotion will induce or prevent a paroxysm; its attacks are most frequent at night, are hepta-periodic, are readily excited by stimuli to mucous surfaces, especially the genito-urinary, and relieved or cured by fœtid stimulants, metallic tonics, change of air, and regimen. Like all spasmodic affections not immediately fatal, and dependent upon functional derangement, whether caused by poisons or otherwise, it is frequently accompanied by some

morbid state of the skin; and, like several of them, its premonitory and paroxysmal phenomena implicate the external senses, exalting or diminishing their sensibility; as well as the salivary glands, respiratory and gastric viscera, and the pelvic contents.

Neuralgic Convulsions.—This modification of epilepsy is closely allied to that form connected with an aura. The phenomena of this aura are well known. It has been supposed to arise, firstly, from a diseased state of the nerve in which it commences; secondly, from organic change in the brain and its coverings. Pathological anatomy, however, can scarcely solve the problem, for the trunks of the nerves implicated have been seldom examined through their whole extent; and changes may take place in the brain and nerves during life, of which there can be no necroscopic trace. In proof that the aura originates in disease of the distal extremity of the nerve or of its trunk, we have several positive facts. A ligature applied to the limb affected will arrest the paroxysm, a remedial measure not less ancient than the destruction of the part in which the aura originates. Paulus Ægineta recommended a ligature to be applied to the limb affected during the fit, and escharotics in the interval to the seat of the aura.[g] Galen arrested the paroxysms in a boy by ligature,[h] and Bonet was equally successful. This author states that the part swelled where the aura was felt.[i] The ligature is used on the Continent, and by Elliotson, Sir A. Cooper, Bright, and others in England. Dr. Craigie supports the opinion that the presence of a morbid growth in the nerve is the material cause of the aura,[k] and quotes the case related by Dr. Short, who cured an epilepsy by cutting a minute painful tumor from the gastrocnemius, from which an aura proceeded. Dr. Craigie also states that both Mojon and Covercelli found epilepsy connected with minute painful tumors. Portal cured an epilepsy by removing a tumor from the seat of the aura;[l] and Professor Mayer was equally successful by amputating the thumb from which the aura proceeded.[m] Van Swieten expressly

[g] X. Lib. iii., cap. xiii.
[h] De Locis Affect. iii., cap. xi.
[i] Sepulch. Anatom. lib. i., § vii.
[k] VII. xxix.
[l] Cours d'Anat. Med. iv., p. 247.
[m] XLV. viii., p. 250.

mentions destroying the nervous communication between the seat of the aura and the brain, as a sure means of cure.[n] It cannot be justly inferred from these cases, that the disease of the nervous twig is the *cause* of the fit; for as epilepsy, like other nervous affections, is cured by mental emotion, this *may* have been the efficient agent, when ligature and excision have been practised. It is better perhaps to say that a morbid state of the nervous system precedes each paroxysm, and is indicated by the sensation of aura in any nerve in which there is already organic or functional disease, and whether the latter be at its peripheral or central terminations, or in any part of its course. If no one nervous twig be more diseased than another, then there is the fit without the aura.

Now in the class of convulsions under consideration, pain and exquisite tenderness of some particular point takes place of the aura, as the indicant of local disease in a nervous twig. A very slight injury to a nerve-fibril, as from the puncture of a lancet, or of a pin or needle, is sufficient to induce the local changes through which the general convulsions are excited. (Swan, Brodie.) Subcutaneous tubercle is also an occasional cause of these paroxysms. We are much indebted to Mr. W. Wood for his laborious inquiries into the nature of this affection.[o] The tubercle is a small firm substance which involves a nervous twig, and generally a twig distributed to the skin; a fact of considerable importance, for it tends to the inference that the cause of the aura is seated in the motor fibrils exclusively, while the affected fibril in neuralgic epilepsy or convulsions is sensitive. These tubercles were found principally in females. Of thirty-six cases collected by Mr. Wood, five only were men, and two of unknown sex. In twenty-three the tubercle was on the lower,—in eleven, on the upper extremity. In the men it followed blows or punctures; in the women it originated spontaneously, and for the most part on the lower extremities. The neuralgic paroxysms and convulsions of which these tubercles are the exciting cause, are subject to the same influences as their congeners. They may be developed by a slight touch of the tubercle, by a cold

[n] LVIII. i., p. 380. [o] CXXXVIII. iii.

wind, by surprise, or by any affection of the mind (Swan); they occur most frequently at night (Hall, Wood, and others); during menstruation and pregnancy (Bisset, Pearson); or any general indisposition or dyspeptic state (Hall).

But the touching of a morbidly sensitive fibril in which there appears no disease whatever, may excite a paroxysm of convulsions; the neuralgic sensibility depending upon changes in the nervous centres, or in compression or irritation of a fibril in some part of its course. In these cases the spasmodic action may be local; thus the gasp excited by pressing a particular portion of the sternum (see p. 332) or the posterior median line between the scapulæ, depends on a short convulsive action. Now it is quite certain that mere irritation or disease of a nerve will not excite convulsions any more than mere organic disease of the brain: cases of both kinds are observed daily, with scarcely any disturbance of the nervous system. We can only consider that in neuralgic convulsions, as in epilepsy, hysteria, &c., there is a predisposing condition of the nervous system. And we find that these convulsions correspond in all other points, being equally influenced by quotidian or hepta-periodic agencies, by the peculiarities of sex, (since they are observed only in females,) by casual irritation either of the mind or of mucous surfaces, and equally transmissible as a hereditary taint.

Rhythmical or Trochaic Chorea.—I have already discussed the nature of these movements. (Part II., chap. vii., sect. 1.) In these paroxysmal affections every variety of combined muscular action may be performed in measured time; alternate pronation and supination of the arm, regular malleation, or beating with the hand as if hammering, opening and shutting of the eyelids, flexion and extension of the trunk, rotation of an extremity, &c. These may end in an irresistible propensity to dance, to run forwards, backwards, revolve on the long axis of the trunk,—or in epilepsy, tetanus, catalepsy, &c.

An impulse to rhythmical movement, and a love of musical sounds, are common in animals as well as man. (130, 222.) It may be observed in birds; dogs and horses will trot in the most regular time; children delight in measured movements, as may be seen daily when they are at play, or congregated round a

hurdy-gurdy; a propensity which the conductors of infant-schools have made extensively available for the purposes of instruction. This propensity to rhythmical movement is illustrated by the mechanically-repeated movements in which some people indulge, as wagging one leg across the other, drumming with their fingers, hitching up a shoulder, drawing their hand across the chin, &c. Any one who will take the trouble to *time* the motions of these social gadflies, will find that they are done at distances of time precisely equal. It is not generally known how this propensity pervades our actions and even our thoughts. Darwin has shown that verses may be divided into bars of triple and common time,[p] and remarks, "some prose has its melody and even measure."[q] Johnson's sonorous stately style is an instance of this. Savage nations have always composed in metre, and it would appear that prose indicates a higher developement—a power to escape the agency of the propensity, or to modify it. Even public speakers talk and gesticulate rhythmically, and also individuals in animated conversation.

A tune or a measured monotonous sound is usually connected with these choreal movements, as the "tic-tac" of a clock, or a pleasing air in common time. (Par. 294, and p. 286.)

Movements in Relation to Space.—The convulsive motions in a definite direction have been noticed before. (290.)

Catalepsy.—A curious book might be written on the scepticism and credulity of medical men with reference to the diseases of women. Scepticism is certainly at fault in the history of catalepsy. Stoll states that Hippocrates describes it under the term φροντιδα,[r] and that Galen, Ætius, Rondeletius, and Fernelius have all related cases. Ætius has left an accurate description of both catochus and catalepsy.[s] In 1683, Laurence Bellini published a quarto volume on various subjects, one of which was catalepsy. Since that period many cases have been recorded by various observers, and the occurrence of the disease is now established by the most complete evidence.

Catalepsy consists essentially in coma, (yet consciousness is

[p] *Loves of the Plants*, Interlude iii.
[q] Ibid. Interl. i.
[r] De Morbis, lib. ii.
[s] Tetrab. ii. Sermo ii., cap. iv.

not abolished in every case,) with an automatic contraction of the muscles, when external force is applied to the limbs; that is to say, in whatever position a limb is placed, its muscles contract, and maintain that position. Yet, in general, the contraction is not energetic, for it is not difficult to alter the position of the limb. Both the flexors and extensors act in catalepsy; in sleep, coma, and paralysis, the flexors only, and that in but a slight degree; it seems to be an automatic contraction, such as is observed in the leg-flexors of the common fowl when sleeping. Now, in catalepsy, we have this automatic contraction of both flexors and extensors; so that there is a due antagonism established at every change of position, which is maintained until a force is applied greater than the muscular contraction can resist. This view of the state of the muscles in catalepsy obviously connects the disease with the last-mentioned class. In "brown study" or reverie, the eye is fixed by a muscular action analogous to the cataleptic; and not the eye only, for a limb, or the whole body, will remain in the same position for many minutes; the senses themselves being in deep abstraction from surrounding objects. In short, absence of mind is really disease of a cataleptic character.

Now, this muscular action will vary, of course, from a tetanic to a paralytic state. When it is tetanic, it constitutes the paroxysm termed "catochus,"—an affection in which the trunk and limbs are rigidly extended, and consciousness is abolished. Other forms of tetanus are also observed. A case related by Mr. Ellis, of Dublin, illustrates very well this connexion between tetanus and catalepsy;[t] and it has been made the subject of an Essay by Dr. Friedländer.[u] Sometimes catalepsy has been observed to attack half the body only, like paralysis, tetanus, &c.[v] It is generally connected with aphonia, and often periodic.

Little is known of the pathological anatomy of catalepsy. Boerhaave states that the vessels of the brain are distended by a dense clot;[w] but in a case observed by Dr. Elliotson, these vessels were exsanguious.

[t] XXX. ii., 1835, p. 129. [u] Oësterr. Med. Jahrbb. Bd. xvii., st. 2.
[v] LVIII. iii., p. 312; and XI. i., p. 825. [w] LVIII. iii., § 1041.

The causes of catalepsy need not be enumerated; they are precisely those of nervous paroxysms in general, with which it is closely connected—a fact noticed by many writers, as Galen, Benivenius, Hollerius, Van Swieten, Sauvages, Elliotson, Prichard, &c.

Leipothymia.—This is a sudden loss of muscular power, a temporary paralysis of the whole voluntary system, the pulse and consciousness being usually unaffected. It is sometimes accompanied by the sensorial symptoms of epilepsy, as whizzings, flashes, coloured rings, &c.

Carus; Cataphora.—These are comatose affections, without spasm or convulsive action. In carus the sleep is profound, and the respiration calm. In cataphora the sleep is less profound; the patient may be roused, but sleeps again immediately. They are generally observed in florid, robust young women.

Trance.—If a young woman remains a long time (days and weeks) in carus, and, on being roused, relates the infinity of dreams she has had, every body says she has been in a trance. There is no end to the marvellous stories about these trances, and the visions, revelations, and wonders the patient has seen and heard. If a crowd follow after her, she will prophesy, speak in unknown tongues, live without food, and perform all sorts of marvels.

Asphyxia; Syncope Apparent Death.—In this affection, to which I have already referred, (Introduction,) the pulse and respiration are imperceptible, the extremities cold, and the whole muscular system paralysed. Consciousness is variously affected. The patient may hear; as in that remarkable story of a young female in this state who broke out into a sweat from agitation, and so showed that she was alive, when they were about to screw her coffin-lid down; or the patient may dream, and be in a trance; or, lastly, the period occupied by the paroxysm may be an utter blank, as in the well-known case of the celebrated Lady Russel.

Ætius mentions hysteric death as being very common in his days; and asserts that real death may supervene without any of the ordinary symptoms. The eyes preserve their brightness, and the colour of the skin remains vivid. In the Journal

des Savans for 1745, it is stated that the body of a female, whose actual decease was doubtful, remained unchanged for eight days. Many marvellous stories have been related, from time to time, respecting cases of this description. The misfortune which happened to Vesalius, in commencing the dissection of a female when in a paroxysm, is well known. Leigh Hunt has made an instance of this kind the subject of a drama, entitled, "The Legend of Florence." A young lady, described by her jealous, ill-tempered husband as a "household trembler," as one who starts "at opening of doors and fall of pins," is so fretted and wearied by his perverseness, that at last she apparently dies, and is entombed. Fortunately, she was not coffined; and, on recovering, was enabled to get out of the vault. The street through which she passed on her return home received the name of the *Via della Morte* from this circumstance.

Diagnosis of Apparent Death.—Sauvages gives the following:—The paroxysms may be known from actual death, 1. from the previous symptoms of hysteria; 2. if the finger be introduced into the vagina, some motion of the uterus will be perceived (?); 3. cantharides will raise vesications; 4. the actual cautery will rouse the patient. But even when the vital powers cannot be re-excited by any means whatever, he still very properly advises that the body be left perfectly free from all restraint, and not interred until it begin to show signs of decomposition.[x] A good general rule would be to treat it exactly as if alive; that is to say, it should be kept warm, watched, and restorative means used from time to time. Dr. Hope thinks the second sound of the heart might be heard in these cases, although the first might not.

Delirium; Ecstasy; Spectral Illusions; Somnambulism.—These are placed together because they are closely allied. They are connected with the convulsive paroxysms by the comatose affections just alluded to; but the will and consciousness are aberrant. They are, however, often concurrent with affections of the motor system,—so frequently, indeed, that Dr. Prichard considers somnambulism as a species of epilepsy.

[x] XI. i., p. 819.

Delirium.—As profound sleep is the type of coma, dreams are the analogues of trance, delirium, and ecstasy. In profound sleep all the sensorial and motor centres are in a state resembling paralysis; but in dreamy sleep the paralysis of the sensorial organs is incomplete, and the changes excited in them we can in some degree perceive; but there is still paralysis of the primary organs of perception and volition. We can both perceive and will, but the changes in the motor nerves cannot be excited, nor can we perceive the primary changes in the nerves of the senses; that is, we do not *feel.* Yet still the changes do take place, and originate other changes which become objects of perception; these may be termed *ideagenous* changes; they are resuscitated ideas, perfectly incongruous, because the comparing and judging organs, and the organs of these, the external senses, are paralysed.

These changes (which are strictly analogous to reflex movements) are by no means peculiar to man. Nightingales dream, and their visions have the complexion of their character, for they hum their airs with a low voice.[y] In answer to Aristotle's query, whether animals hatched from eggs ever dream? Marcgrave answers, "that his parrot Laura often arose in the night, and prattled half asleep."[z] Canaries and dogs dream.

Now delirium originates from all the causes which excite coma and paralysis. When they act with diminished force, the result is a less amount of paralysis of the cerebral organs; the primary changes derived from without, being more or less perceived, complicate the *ideagenous* changes; and the motor nerves are also somewhat controlled by the will. Usually in delirium an act of attention so alters the condition of the brain, that the paralysis temporarily disappears, or, in common phrase, the delirious patient will listen or speak when roused. That it is the act of the will (although an involuntary or "excited" act) which removes the paralysis is evident from the fact, that insanity or paralysis of the intellectual organs has been removed, as well as motor paralysis, when a violent effort has been made from terror, &c. (286.)

[y] XXIII. xv., p. 315. [z] Ibid. xvi., p. 416.

Hysterical delirium is subject to precisely the same laws as other paroxysmal diseases,—is often accompanied by the various pathemic affections of the respiratory muscles, mentioned in Chap. iv., sect. iv.,—or passes into somnambulism. It has peculiar characteristics according to the mental bias or organization of the patient.

Musical delirium is the most common kind of delirium. The faculty which originates this peculiarity is compounded of two simpler faculties, namely, that which measures the time, (see p. 314,) and another which notes the harmony of sounds. I think these two have occasionally been confounded. An individual may keep excellent time, and have no ear for music, being unable to distinguish the fundamental and harmonic sounds, just as some can see no difference between the fundamental (primitive) and harmonic (complementary) colours (see *infra*). We have already seen that the *tarantati* are very susceptible of discords. (251.) A female with musical delirium exhibits a propensity to sing or play on some musical instrument; and she will do both with a taste to which in health she is quite unequal: the faculty is developed in somnambulism, mesmeric delirium, some cases of poisoning, &c. The power of composing poetry exhibited by the insane, (especially females,) and occasionally during sleep,—the quotation of poetic fragments,—"capping rhymes,"—and other analogous phenomena, belong to this head.

Spectral Illusions.—These are dependent upon similar morbid states as delirium, but the affection is circumscribed, and there is no paralysis of the primary sensitive fibrils. Consequently, all the senses give correct impressions, and unless the patient be insane, that is, have paralysis of the comparing and judging organs, she is perfectly aware of the real nature of these deceptions of the sight.

The causes of spectral illusions are the same as of other diseases, and they are influenced by the same circumstances; they will return periodically, and are usually observed at night, like all paroxysmal affections. In a very remarkable case related by John Wesley, in which the disease assumed the tertian type, the patient was told by her uncle that evil spirits seldom appeared but between eleven at night and two in the

morning. But after they have appeared to a person a year, they frequently come in the day-time."[a] Popular observation, rightly interpreted, is generally correct. The spectres are always of that class of objects most familiar to the individual, or which have been early or deeply impressed on the mind. In short, they follow the laws of memory in every respect; so that the old man will see spectres in dresses as people were dressed when he was young, not as he saw them yesterday. Another peculiarity is, that the spectres are most frequently dressed in red. Mr. Abernethy mentions an instance;[b] and Mr. Macnish asks why they should appear in red rather than blue.[c] The solution of this question is not difficult—(see next Chapter, sect. ii).

Other sensorial illusions are analogous to the spectral. A religious enthusiast complains that he hears voices continually inciting him to blaspheme, or "airy tongues that syllable" his name. The most remarkable is that in which the individual refers his sensations and actions to another person. A man comes home exceedingly drunk, and is positive his servants are too tipsy to undress him. Hunter saw a delirious patient who, when he was hungry, said his nurse was.[d] I visited an individual dying of sphacelus of the leg. He was delirious and clutched at the air, expecting to grasp a fish-hook, (being an experienced angler,) and when lying still and moaning, turned round and asked occasionally—who was disturbing him so? who was in pain? This form, as well as all others, is observed in the insane. Dr. Allen mentions an instance of an old man who had an odd way of talking to himself, as if he himself were some other person, saying, "What a noise the fellow makes. I think the fellow 's a fool," &c.[e] This state occurs, too, in dreaming. An individual returns late at night from a public assembly, where he has taken more fluids than customary, and he dreams of the company, and that some one is in great distress from a distended bladder, which he strongly recommends the supposed suffering indivi-

[a] Works, iv., p. 360. [b] Lectures, XXX. xi., p. 27.
[c] Philosophy of Sleep, 2nd Ed., p. 261. [d] CXVIII. i., p. 335.
[e] Cases of Insanity, p. 11.

dual to evacuate. The pain increases, the whole assembly appears conscious of it, and is disturbed; and at last he awakes to find that the distended bladder is his own.

These various illusions will vary in degree from those of dreaming, through delirium, mania, &c., to sound health. They may be made to appear and disappear by the will of the patient,—another proof that the sensorial fibres are under the control of the will, (185,)—and thus have actually become a source of amusement to the invalid.

Somnambulism.—A paroxysm of somnambulism is a dream acted. Complete anæsthesia and paralysis of the other senses, excitement of the brain giving rise to vivid spectral illusions, and voluntary power over the motor fibres, are the distinguishing characteristics of somnambulism. It is very improbable that the somnambulist derives any primary sensations from without; his actions result altogether from internal sensations, and if they appear to have the precision of waking, it is because he is in a locality corresponding to his dream; remove him from the locality, and he gropes and stumbles. Sometimes, however, the paralysis of the senses is imperfect, and the individual is rather delirious than sleeping; at other times he is affected as if intoxicated. Sauvages[f] relates the case of a female who was insulted by a rustic while menstruating; periodical attacks of cataleptic somnambulism were induced, in which she would mistake her medical attendant for her enemy, and follow him or his shadow round the room. She had no recollection of her husband. These forms verge closely on insanity, and are sometimes complicated with it.

The spectral illusions of the somnambulist, like those in other cases, are derived from objects familiar to the individual, or early or deeply impressed on the mind. They will be vivid in proportion as the individual's attention is concentrated upon them, and this concentration will be in proportion to the anæsthesia. If external perceptions in any degree divert the attention, the somnambulist will be affected with delirium, and the spectral illusions will disappear, or lose their distinctness.

A variety of curious stories have been recorded respecting

[f] XI. ii.

somnambulists. Dr. Elliotson has collected several.[g] In Anthony à Wood's History of Oxford,[h] there is an account of a somnambulistic M. B. who "did practice physic by day, and preached at night in his bed. He would take a text in his sleep, and deliver a good sermon upon it; and though his auditory were willing to silence him by pulling, haling, and pinching, yet would he pertinaciously persist to the end, and sleep still." James the First had him to court, sat up with him, and heard him. Next day he sent for him, and "in private handled him so like a cunning surgeon, that he found out the sore, making him confess," &c. The account is copied from Arthur Wilson's "History of King James," who states that the King gave his patient preferment. One of Wesley's assistants used to preach in his sleep. Mr. Spencer saw a somnambulist (a young girl) in Circassia,[i] who prophesied, &c., in the paroxysms.

Clairvoyance, Second-sight.—The prophetic power, (so called,) in cases of ecstasy, somnambulism, trance, &c., may be considered as nothing more than an exaltation of the faculties of judging and comparing, itself the result of morbid excitement. Many religious enthusiasts have exhibited it; it has been observed in dreaming; individuals in the delirium of death have prophesied. Aretæus has left a very elegant description of the faculty when developed in a patient on the approach of death from καῦσος or brain fever.[k] Poets have laid hold of this circumstance; thus Homer makes Patroclus, when dying, foretell the death of Hector; and in Virgil's Æneid, the dying Orodes predicts the fate of Mezentius; Shakspeare has similar scenes. Sir H. Halford has witnessed an instance answering to the description of Aretæus.[l] Mr. Madden explains this "lightning before death" by supposing that venous or deficiently aërated blood acts as a stimulus, producing effects resembling those of opium. Physical pain is lulled, the sensations exalted and soothed, long-forgotten pleasures recalled, &c.[m]

[g] In his "Human Physiology," 5th Edition.

[h] Edited by Gutch, 4to. Oxford, 1796, Vol. ii., p. 284.

[i] Travels in Circassia, &c., ii., p. 405.

[k] IX. Lib. ii., cap. iii.

[l] Essays and Orations, 2nd Edition, p. 60.

[m] The Infirmities of Genius Illustrated. 2 Vols. 8vo.

There are a variety of tricks of "legerdemain" which have been practised by young women, and into which they have been seduced by the stupid and ill-judged wonder of the bystanders or medical attendants. These do not even deserve notice, except one, namely, that of stating the hour when a watch was placed to the nucha or epigastrium under circumstances such that the patient could not have previously known it. Somehow or other people know what o'clock it is when asleep, and without watch or clock near them, and will awake at a time fixed on over night, to the exact moment. I have myself more than once awoke within two minutes, and frequently within five minutes of the hour so fixed: for instance, at three o'clock in the morning, when my usual waking hour was seven; and I have awoke at the hour at once, from what has appeared to be a profound slumber. Now, something of this kind may occur in the cases alluded to above.

Treatment of Paroxysmal Affections.—In the intervals, the treatment of these affections must be on general principles; usually the metallic tonics are of the greatest service combined with occasional purgation. Ligature of an extremity, pressure on the carotids, and dry cupping of the nucha or loins, or even of the legs, may be practised, both just before the anticipated paroxysm, as a prophylactic, and during the fit, as a means of relief. Dr. Graves speaks strongly in favour of the utility of dry cupping;[n] it was much used by the ancients; P. Alpinus mentions it as being a common remedy in Egypt,[o] and it is still used in the East. M. Junod has devised large cupping glasses for this purpose, so that a whole extremity, or even the lower half of the body, may be placed in them, and the air rarefied. He has cured the most profound apoplexy, as well as various hysterical affections, by these means. It ought to be stated that the glasses will produce faintness, which continues so long as they are applied.[p] During the fit the indications to be fulfilled are, to prevent the patient being injured by herself or the bystanders, and to shorten its duration.

With regard to the first indication, it is well known that the

[n] XXXV. iii., p. 160. [o] III. with plates of the cups.

[p] Gazette Med. de Paris, No. 25, 1838.

bystanders will do all sorts of foolish things if not checked; the patient should be simply restrained, cold drinks or enemata given, and cold affusion practised; cold is the sovereign remedy. When coma supervenes and continues long, venæsection should be adopted, if the state of the patient will allow; and cold douches to the head, diffusible stimulants to the mucous membrane of the nose, pharynx, and stomach, stimulating frictions to the skin, succussion, shouting, &c., should be tried; in short, cold to the skin, stimulants to the mucous membrane and the organs of the senses. Spirit of turpentine given as an enema is very efficient, and may be combined with camphor and asafœtida.

It should be remembered that the paroxysmal affections treated of in this chapter, are, in common with their congeners, continually modified in the mode of recurrence by periodic influences and changes, as demonstrated in Part I., chap. iv., sect. i. and ii. To these I refer the reader, and would only remark, that if the paroxysms assume the type of a regular intermittent, they must be treated as such; if they occur at heptal periods, they must be anticipated by prophylactic measures, and the habit of regular recurrence broken, if possible, by moral and medicinal treatment.

CHAPTER VII.

AFFECTIONS OF THE SENSITIVE NERVES.

The painful diseases of hysterical women may be divided into distinct classes. First, there may be a morbid state of the whole sensorial system, giving rise to undue general sensibility; yet while all parts suffer equally, or the sensibility remains within certain limits, no particular disease shows itself. But when the tone of any one portion is raised above, or depressed below *par*, whether from mechanical violence, over-exertion, or peculiarities in its functions, that portion will be affected by neuralgic sensibility, neuralgia, or anæsthesia. Secondly, the affection may be local, that is to say, confined to some portion of the central axis; the neuralgia will then be limited to the periphery of the nervous system in connexion with that portion. Or, lastly, the morbid state may be confined to the trunks of the nerves. The reader will better understand these various forms on reference to Part I., paragraph 195. Neuralgic diseases will be best considered as they affect the nerves of common and of special sense. In the first will be included all affections of the surface, and of the muscular structures; in the second, those of the cerebral nerves. This arrangement will be imperfect, however, in so far as the nerves of the skin are in part cerebral nerves of touch. Sir C. Bell,[q] and Breschet,[r] both consider that the organ of touch is not a mere nerve, but a special apparatus placed on the skin; and that the sense of touch is a special sense, as much as seeing or hearing. It will, of course, be subject to illusions and morbid

[q] The Hand, its Mechanism, &c., 2nd Ed., p. 178.

[r] Nouvelles Recherches sur la Structure de la Peau, 1835.

sensibilities as well as the other senses, and this must give rise to many anomalous sensations or feelings. The touch is that sense by which we judge of weight, or, in other words, perceive resistance, as I have shown elsewhere;[s] and illusions as respects the weight of bodies are not at all uncommon, as well as feelings of pressure, &c., on different parts. These cerebral phenomena must of course be considered with those in which the cerebral senses are implicated.

SECTION I.

THE NEURALGIÆ.

Neuralgiæ from Disease of a Nerve.—A small cicatrix, or a tubercle, inplicating a nervous twig, will cause most violent paroxysms of neuralgia, and convulsions. (Page 312.) In these cases, the evident cause of the pain must be removed by knife or caustic.

Articular Neuralgiæ.—The ankle, knee, hip, wrist, and shoulder, are occasionally the seat of symptoms simulating organic disease of the articular surfaces so closely, that practitioners have been led into the serious mistake of removing the affected limb. Mr. Carmichael "witnessed two instances of amputation performed by experienced surgeons, in the belief that the patients laboured under ulceration of the cartilages, and yet, on examination of the amputated joints, not a vestige of organic disease could be discovered."[t] Sir B. Brodie relates one such case in which "two surgeons of eminence in the country" were surprised to find that there was no collection of matter in the cavity of the joint,—that the cartilages had disappeared in one spot, of very limited extent, and that there was no other mischief."[u]

The pain is variously described by patients; it is usually a gnawing or aching pain, such as is felt in muscles and tendons; and there is often, but not always, great tenderness to the touch. At first there is no perceptible swelling around the

[s] VII. l., p. 337. [t] XXXV. xiii., p. 299. [u] XIV. xix., p. 284.

joint; but if the patient use counter-irritants, or the neuralgia have continued long, some effusion takes place, and there is more or less tumefaction,—in the knee, on each side of the patella,—at the ankle, in front of the joint. Motion aggravates the pain, and rest relieves it; the patient discovers this, and will rest the limb, in many cases keeping continually in the recumbent position, either on a sofa or in bed.

When the ankle is affected, the pain is referred to the front of the joint, about the instep,—when the knee, it occupies the inner margin of the patella, or the inside of the joint,—when the hip, it is scarcely circumscribed; it is in and about the joint, and the neighbouring nerves of the perinæum and thigh are affected; sometimes the whole. In the wrist the pain is on the outer surface of the radius, in the shoulder about the deltoid, and on each side. The pain is sometimes unaccompanied by hysterical symptoms; but then there is a hysterical constitution, or an irritability and mobility of system, such, that a sufficient exciting cause is only requisite to develope them. But in the majority of instances there are some or most of the phenomena of hysteria, while in the affected limb a variety of sensations are experienced, as flushing, burning, alternate heat and cold, &c., symptoms common indeed to most of the hysterical neuralgiæ.

If the motor nerves be implicated as well as the sensitive, there will be wasting of the muscles, so that the shoulder and nates are flattened; but this is rarely the case. The muscles usually continue plump and round, and are debilitated solely in consequence of their long-continued inaction.

The duration of these cases is various, from a few weeks to several years; and the sufferings are so severe, that amputation has been adopted as a means of cure. The following, related by Sir C. Bell, are brief, and worthy notice.[v]

Case XVI.—The handsome Lady —— has been married on crutches. I was consulted some three years ago, and then she had suffered for seven years! The pain is in the ankle-joint, just anterior to the inner malleolus. There is no puff, no visible indication of disease; yet exercise brings on the pain to an insufferable degree.

She had then been treated for disease of the joint.

[v] LXXXII. p. 364.

CASE XVII.—I attended Miss D., a lady of a cultivated turn of mind. She described her sufferings in very animated language. She had been confined to her room for years, and passed most of her time kneeling by the bedside. She took, in the course of twenty-four hours, five hundred drops of laudanum. After visiting her several times, I prevailed on her to let me see the part then affected with scalding and burning, for I expected to see the hip and thigh one extended ulceration. There was no disease, not the slightest discoloration.

These two cases illustrate well the two kinds of neuralgiæ; in the first, the sensitive nerve of a muscular or tendinous structure was affected; in the second, of the tactile apparatus.

Diagnosis of Articular Neuralgiæ.—The general history will supply ample grounds for distinguishing them from organic disease. In the latter the joint is swollen, the position of the limb is peculiar, the muscles are wasted, the pain is increased by succussion of the joint, but slight pressure gives no pain. In the neuralgic affection, striking the heel causes no suffering, but the patient complains much if the skin be pinched or lifted up gently. The pain is less when the attention is distracted, but this is also the case in organic disease; so that I think this fact is of little value as a diagnostic sign. No one will neglect to peruse Sir B. Brodie's practical work on these affections.

Spinal Neuralgiæ.—The rachialgia or spine-ache, described by Ludwig, Frank, and others, and the spinal tenderness upon which much stress has been laid by the writers on spinal irritation, appear to be one affection, and analogous to the preceding. The whole surface of the spinal column may be exquisitely tender, just as may be a whole limb; but there are two points in which a true neuralgia is found, and in which there is most commonly morbid sensibility; the one corresponding to the lower lumbar vertebræ, the other to the middle dorsal, just between the scapulæ. Sometimes the portion of the skin covering the second cervical, sometimes that over the tenth or twelfth dorsal vertebra, is affected.

Now the remarks made respecting the articular neuralgiæ are equally applicable to these of the spinal column; they present precisely the same characters, even to slight tumefaction of the affected spot; they originate in the same causes;

the same errors have been committed in their diagnosis and treatment; and they are distinguished and cured in a similar manner.

Spinal tenderness is very common in other diseases besides hysteria;—in phthisis, in aortal aneurism, in diseased heart, in diseased kidneys; as I myself have observed. Dr. Entz, a writer on irritation of the spinal marrow, has found spinal tenderness in almost every case of dysmenorrhœa, and in most cases of menorrhagia, which have occurred of late years in his practice.[w] According to the Messrs. Griffin, this symptom is observed in almost all hysterical complaints, and in numerous cases of functional disorder; and may arise from uterine disease, dyspepsia, worms, liver diseases, mental emotions, miasm of typhus and marshes; from fevers, whether continued, erysipelatous, rheumatic, or eruptive; and even from pregnancy.[x] There is no limit to statements of this kind in authors.

There is much confusion with respect to the signification of the terms "spinal irritation" and "spinal tenderness." Dr. Brown, who first started the doctrine, thought the spinal muscles were spasmodically affected at or near the tender points; and so compressed the nerves as they issued from the foramina.[y] Mr. Teale thinks the cord suffers irritation or subacute inflammation.[z] The Messrs. Griffin speak of "a tender and irritable state of the cord." Dr. Billing says, that in many consultations at which he has been present, "the tenderness on pressure and on striking the vertebræ, showed plainly enough that the spinal cord was physically affected."[a] Some speak of irritation at the *roots* of the sensitive nerves; but where are these roots? In the hemispherical ganglia? in the spinal? or at the point at which the nerves enter the cerebro-spinal axis?

It is worth inquiring, *what* we press, when we exert pressure on the vertebral column. Obviously, first, the skin; then the

[w] Rust's Magazin für die Gesamt. Heilk. 1836. [x] LXXXVIII.

[y] Glasgow Med. Jour. No. 2.

[z] A Treatise on Neuralgic Diseases dependent upon Irritation of the Spinal Marrow, &c. 8vo. 1829. p. 19, seq.

[a] CXXI. p. 115.

muscles, bones, ligaments; but never the spinal cord or its membranes, unless the bones or ligaments be destroyed. An inspection of the vertebral column will convince the reader at once of this truth. The length of the cervical spines, and the over-lapping of the dorsal, not to mention the strong ligaments and massy muscles covering the transverse processes, render the spinal cord as secure from pressure from without as is the brain.

Is spinal tenderness of any value as a diagnostic sign? The answer is, that disease of the vertebræ, and even of the cord itself, may go on to an extraordinary extent, with very little or no tenderness of the vertebral column,[b] and with but slight functional derangement of the organs in connexion with the spinal cord. Velpeau has collected twenty-five cases of disorganization of the medulla spinalis without disturbance of the nervous functions. In some, the length of four inches was changed into a reddish fluid.[c] In the instances of disease of the intervertebral cartilages which have come under my notice, there was no spinal tenderness; nor is it probable there would be, when we remember that the morbid process commences on the anterior portion of the surfaces of the vertebral articulation; at least, such was the fact in three cases of psoas and lumbar abscess, dependent on caries of the vertebræ, which I have dissected.

But do not the gasp and spasms excited by pressing these tender points of the spine, show a close connexion with the cord? Certainly. But does not the accession of convulsions, on pressing a neuralgic cicatrix on the arm, or a subcutaneous tubercle in the leg, show an equally close connexion of these with the cord? Nothing results from the comparison but the inference that the spinal neuralgiæ are precisely similar to all other neuralgiæ; and, *quoad* the state of the spinal cord, are of but little value in diagnosis.

Spinal tenderness may indicate disease of some portion of the cerebro-spinal axis; and since the viscera, by re-acting upon the spinal ganglia, may put them into such a condition that all sensorial impressions, in passing through them, are

[b] XCIII. xxiv., p. 44. [c] Arch. Gen. 1825.

magnified, it may also be considered as a symptom of functional or visceral chronic disease. Like other morbid sensibilities, its presence will indicate the neuralgic or hysteric constitution; and as it is one of the neuralgiæ which appear first, in this way it may be a valuable diagnostic symptom; and such I consider it to be.

In the severer forms of spinal tenderness, counter-irritants act tardily and with difficulty; probably from an incipient paralysis of the organic nerves. In the milder forms, the stimulant applications are exceedingly severe, from the great morbid sensibility of the skin. Thus, when I have directed tartar emetic ointment to be rubbed on the whole length of the spinal column, pustules have appeared immediately and only between the shoulders and over the loins, which were exquisitely sensible; and, upon examination, I have found these to be neuralgic spots.

Spinal tenderness is not peculiar to women; Sir C. Bell mentions a most remarkable example of it in a gentleman, in whom it supervened on a profuse hæmorrhage from piles.[d]

Sternal Tenderness.—In not a few cases of asthmatic hysteria, if a spot about the middle of the sternum be pressed on, the patient feels acute pain, and gasps for breath. If it be pressed simultaneously with the neuralgic spot between the shoulders, she complains that the sense of suffocation excited is intolerable, and shrinks from a repetition of the experiment.

This form of neuralgic sensibility, of which I have observed several instances, has been rarely noticed. Stoll mentions an interesting case.[e] The following occurred to myself:—

Case XVIII.—A hysterical female, of the name of Hebditch, came into the York County Hospital with extensive sloughing of the tonsils. When recovering, she complained of a tender spot in the centre of the sternum. Pressure upon it, and on the opposite point of the back, caused gasp. She would not permit me to touch both points at once; she was sure it would suffocate her. Tenesmus, griping, and flow of blood from the anus, came on; she then menstruated, and immediately recovered.

In another case in the Hospital, a slight touch or gentle

[d] LXXXII. p. 368. [e] XLIII. Pars iv., p. 189.

pressure on the first or second bone of the sternum caused cough immediately.

It would appear from Weber's experiments, that there are portions of the surface on the anterior and posterior median line of the thorax, which are more sensitive in a state of health than the rest; as he ascertained by the application of his compasses. This sternal tenderness presents an interesting pathological illustration of the fact; and it may be fairly supposed that the points demonstrated by Weber are the seat of these neuralgiæ.

Sometimes, however, the sensitive spot is lower down. Sir B. Brodie states that "a young married lady, who was liable to ordinary attacks of hysteria, complained of a tender spot on the anterior part of the abdomen, a little below the ensiform cartilage. The slightest pressure of the finger on it caused excessive pain and violent convulsive movements of the whole person, resembling those of chorea."[f] Sir Benjamin also relates another similar case. It is remarkable that these tender spots are always on the median line. May not the terminating twigs of the symmetrical spinal nerves have some directing influence on these neuralgiæ?

Costal Neuralgiæ.—An acute pain, with tenderness, occasionally attacks one or other of the sides of the chest, generally about the convexity of the sixth or seventh rib. It will recur in paroxysms, like other neuralgiæ; or it is sometimes present as a constant gnawing pain. It probably originates in irritation of one of the intercostal nerves. It has been cured by sawing out a portion of the rib corresponding to the affected nerve.

Pain in the Left Side.—It is very common for young women, apparently in robust health, but who have fatiguing domestic and sedentary employments, to suffer from a pain in the left side; not in the breast, but just below it. It is described as a gnawing, bruising sensation; is sometimes accompanied by spinal neuralgiæ and other hysterical symptoms; sometimes by slight angina pectoris and palpitation; sometimes by dyspepsia, pyrosis, &c. It recurs occasionally in paroxysms, is

[f] XIV. xix., p. 250.

not influenced by the respiratory movements; but taking food, fatigue,—especially the erect posture, anxiety,—and all depressing agents, exasperate it. Like the spinal neuralgiæ, it is much relieved by the recumbent posture. It is an obstinate affection, and is usually aggravated by any other treatment than the hygienic, and will often wear itself out.

This is universally allowed to be a neuralgic disease; but its seat has been variously described. It has been considered to be morbid sensibility of the apex of the heart; of the pleura; of the respiratory apparatus; of the intercostal muscles. In some cases it is analogous to the sub-scapular pain which accompanies hepatic disease; in others, it is a distinct costal neuralgia; and probably, in others, the heart, pericardium, and pleura are affected.

Abdominal Tenderness.—In cases of hysteria, in phthisical diarrhœa, and in most diseases of an asthenic character, the surface of the abdomen is exquisitely tender, and the patient shrinks from the slightest touch. This symptom is worthy notice, as it might induce the unwary practitioner to adopt an active antiphlogistic treatment, to the serious injury of his patient.

Diagnosis of Abdominal Tenderness.—See that of hysterical colic, p. 246.

Neuralgia of the Rectum and Anus.—This is a very distressing affection, as the slightest touch, whether of fæces or of even an opiate suppository, causes excessive pain. It has been mistaken for stricture of the rectum. Sometimes it is accompanied by spasm of the perineal muscles, especially of the levator ani, which draws the anus powerfully upwards, as if into the pelvis. Macculloch relates a remarkable case of this kind which occurred in a man; the paroxysms were accompanied by regular hysteric fits; the irritation of the rectum and bladder extended up the ureters to the kidneys, and a periodic diabetes mellitus supervened.[g]

Neuralgiæ of the Head and Face.—Shooting pains in the face, teeth, and temples are very common in hysteria, and often assume the regular features and varieties of the facial

[g] XCVI. ii., p. 95.

neuralgia termed tic douloureux. This form will be well known to the reader. It is usually evanescent in women, or at least it more readily yields to treatment than in men, and is sometimes intermittent; of this kind is the affection of the supra-orbitar nerve, termed brow ague.

Clavus Hystericus.—There is an obstinately painful affection of the scalp thus named, which partakes of all the characters of the other neuralgiæ. It is either a boring, gnawing pain, (when it is muscular,) or the part affected is exquisitely sensible, and the scalp puffy. It is often on the vertex, and is accompanied by head-ache, sense of weight on the head, drowsiness, and many of the usual symptoms of hysteria.

Hemicrania.—Although this might apparently be more properly classed among the head-aches, yet it is manifestly of a neuralgic character. It passes on the one hand into tic douloureux, on the other into clavus hystericus, and is frequently periodic. According to Piorry, it is occasionally connected with a painful affection of the iris.

Treatment of Hysteric Neuralgiæ.—When these affections appear connected with an arthritic diathesis, however remotely, a suitable plan of treatment should be adopted. The use of the waters of Barêge is strongly recommended by Mr. Carmichael, who experienced their efficacy in his own person. It is evident the cause must be discovered and combated. It is of great importance, whatever this may be, that the patient should take exercise, and that her mind should be fully employed and engaged. And yet nothing is more difficult than to get her to move, for motion aggravates the pain, or the cold induces it. The joint affected is always easiest when at rest, or the back or side, when the patient is recumbent; and in bed or on the sofa she will remain. If setons, issues, counter-irritants, &c., have been largely employed, and rest enjoined, the muscles then become really so weak that the limb or back is almost powerless. I have seen a patient so irritable under these circumstances, that the effort to rise from the board upon which she had been extended for five months, induced violent hysteric paroxysms. The means recommended at page 290, should be tried in such cases. Every device should be practised which may tend to excite hope and cheerfulness,

and lead to exercise in the open air. Short tours, water parties, &c., should be recommended; and in cases of spinal tenderness the practitioner should positively assure his patient and her friends of a cure, if she will but adopt the proper means. Of course, the general tonic regimen must not be neglected, as douches, salt-water bathing, metallic tonics, &c.

A host of remedies have been tried and found useful and useless in these diseases. Dr. Copland recommends spirits of turpentine in the articular neuralgiæ. As a permanent palliative of the other forms, stramonium has met with the highest encomiums, opium excepted, from numerous writers, both British and continental, and I think justly. A grain of the extract or of the powder may be given every sixth or eighth hour, but when a feeling of dryness in the throat comes on, the quantity must not be increased. Nux vomica, lactucarium, belladonna, aconite, hyoscyamus, conium, have all been mentioned with commendation. In the inveterate cases, the only hope of cure is in paralysing that part of the central axis connected with the affected nerve. Since the nerve is already one degree towards this state, it may be done by keeping the patient narcotized for a given period. In one case of inveterate tic douloureux which came under my care, I administered a grain of acetate of morphia every half-hour, until the pain was subdued. So soon as this was done, the medicine was intermitted, but was repeated the moment signs of a returning paroxysm manifested themselves. Large quantities of morphia were taken, and the patient's health suffered during the time it was acting on the system; but his existence was rendered tolerable, and as the relief was permanent, his health soon began to improve.

With regard to topical remedies, the last-mentioned object may be, in some degree, attained by endermic medication with morphia, veratria, &c. Unless organic disease be discovered, section of the nerve should not be attempted, as it cuts off all hope of relieving by topical sedatives (195); but pressure on the nerve, especially near a foramen, may be tried. The use of the magnet was prescribed for the relief of painful affections, by Hippocrates and some of the later Greek writers,

as Alexander Trallianus, (lib. xii., cap. i.,) and Aëtius.[h] Van Swieten saw several cases of facial neuralgia cured by it. In a case of nervous disease which came under the care of Stoll, Mesmer and Father Hell had done good by magnets; some very recent writers have testified to the good effects of this remedy. Dry cupping with large glasses, ligatures on the extremities, and pressure on the large arterial trunks, have all been found useful. Dr. Allier, jun., has recorded instances of neuralgia of the external ear, and of the supra-orbitary nerve, which were cured by compressing the common carotid; also of a painful affection of a pudendal nerve cured by pressure on the abdominal aorta.[i] The vapour bath, medicated with the before-mentioned narcotics, or fomentations with them, or liniments and plasters made with their extracts, especially opium and belladonna, have been often useful as palliatives. In some cases the tinctures of colchicum and stramonium have relieved. Powerful stimulants, as hot spirits of turpentine or concentrated liquor of ammonia, have also done good service. Sir B. Brodie has known the following plan of treatment to be attended with excellent effects in those cases of articular neuralgia in which the limb is alternately hot and cold, administering sulphate of quinine contemporaneously:—"During the hot fit, let a compress be applied wet with a cold spirituous lotion; and when the heat has subsided, and the limb has become cold, let a thick woollen stocking be drawn over it, and then an oiled silk covering over the stocking, so as to confine the heat and perspiration. When the cold fit has subsided, the oiled silk may be removed."[j] Patients with spinal tenderness complain of exactly the same symptoms, and the same plan (if practicable) might be useful in that affection.

It ought to be remembered that a joint may be blistered and leeched so long and so much, and the synovial membrane be in consequence so much excited, that it becomes inflamed, and ulceration of the cartilages follows. Counter-irritation in cases of spinal neuralgiæ, if not successful at first, probably

[h] Tetr. i., Ser. ii., cap. xv. [i] L'Experience, No. 16, 1838.
[j] XIV. xix., p. 283.

never will be; and it is as often injurious as useful. Indeed, in all cases of neuralgiæ, topical stimulants and irritants are remedies of doubtful value; much depending on the strength of the application, more on the state of the system at large. Perpetual blisters are only useful in *arthritic* neuralgiæ. The best class of counter-irritants comprises those which affect the mind. Apply any common plaster to the shoulder, for example, just before the accession of a neuralgic paroxysm in the knee; expatiate on its virtues, and request the patient to observe its effects on the shoulder and to give you a full, true, and particular account of them. If the attention be sufficiently occupied by these means, the usual paroxysm may be omitted altogether, or at least its duration may be shortened.

SECTION II.

MORBID SENSIBILITY OF THE SENSES.

The auditory, optic, and tactile apparatus are all paralysed in the higher stages of anæmia and asthenic disease. When paralysis thus occurs, its nature must be obvious, and the phenomena which attend it are too striking to be mistaken.

But there are some more remarkable (because less common) symptoms in hysteria, which complicate the cerebral senses, and are dependent upon morbid sensibility either of the nerves or of those parts of the hemispherical ganglia in connexion with them.

Morbid Sensibility of the Sense of Touch.—Histories have been from time to time related of hysterical patients who could distinguish individuals, colours, and even read, by the touch. Some of these are manifestly instances of the insane cunning observed in hysteria, as that of Miss Macavoy, who assured her admirers that she could read with her fingers much better when aided by convex glasses. I think it utterly impossible to read by the touch in the manner described; reading is a very complicated mental process, and not a simple primary sensation.

Not so the recognition of colours and of individuals. Mr.

Torbet has very recently published the case of a young lady, suffering from aggravated or anæmic hysteria, who experienced total blindness and deafness. Her perceptions by the touch while in this state were remarkably acute. "By a kind of instinct" she seemed to distinguish the individuality of each person. She more than once fell into a hysterical sobbing, when a person she did not like persisted in offering her drink. After the restoration of her hearing, and of the sight of the right eye, anæsthesia and paralysis of the extremities came on.[k] In the fifth volume of the Medical Essays and Observations, a similar instance is related. This young lady was also blind, but knew her friends by the touch, for when any of them took her by the hand, she would call them by their right names. A much less credible history is recorded by Dr. Comstock, an American physician. The subject of this was a young girl suffering from trochaic chorea, and other anomalous symptoms like those of tarantism, which were consequent upon the bite of a large species of spider. In addition to the faculty of distinguishing individuals by the touch, she would, by feeling Dr. C.'s hand for some minutes with great attention, afterwards tell what things he had held in it; and by similar means was able to point out different colours upon one piece of cotton, linen, and woollen cloth.[l] Professor D'Outrepont, of Wurtzburgh, has recorded an instance of somnambulism in a young female[m] who could distinguish her relatives, books, clothes, manuscripts, &c., by the touch; and even the books of her father, if she had handled them previously to her illness.

The blind occasionally offer remarkable proofs of the perfection to which this sense may be brought. Julia Brace, an inmate of the Deaf and Dumb Asylum at Hartford, United States, is deaf, dumb, and blind. She recognises the various inmates of the house by the touch and smell, and can distinguish a silver spoon among one hundred and twenty of baser metal.[n] The perception of colours by the touch is a

[k] VII. xliv., p. 376. [l] L. xx., p. 224.

[m] Casper's Wochenschr. No. xxxviii. 1838.

[n] Journal of a Tour through the United States, by E. S. Abdy, Fellow of Jesus College, Cambridge, 3 Vols. 12mo. 1835. Vol. i., p. 229-230.

faculty which has been often attributed to the blind. A very respectable medical friend mentioned to me an instance of this kind which came under his own observation. The individual was a blind cattle-dealer, and he could distinguish with tolerable precision the colour of the cattle he touched. But all these instances must be received with caution. A gentleman resident near York, and an amateur florist of superior taste, is utterly blind. Medical and other friends have positively assured me that he could distinguish the colour of flowers by the touch, and such is the general belief; yet I learn from the individual himself that it is erroneous. He informs me that he can readily distinguish the form, &c., of the flower, and he from thence infers the colour. He thinks that the colour of dyed clothes might be easily ascertained from the difference caused in the smoothness of the wool by the dye.

It is quite certain that there are differences in individuals not appreciable by our senses, but distinctly so by those of inferior animals; as when a dog scents out his master. In certain fevers, and in cholera, the touch of the patient excites a sensation very similar to an electric shock.[o] Caspar Hauser's senses were all remarkably acute. He could distinguish metals by the touch through paper, and even oil-cloth, by the peculiar electric sensation excited.[p] It occasionally happens that there is a morbid sensibility to the effects of cold or heat; what is scarcely felt by people in health causing rigors, or a sensation of burning, in the nervous patient.

Morbid Sensibility of the Sense of Taste.—This is continually observed in hysteric women.

Morbid Sensibility of the Sense of Smell.—This is equally common as the preceding, especially in warm climates. A variety of histories may be found in books,[q] in which cats, flowers, cinnamon, musk, and other odorous substances, have produced great distress, convulsions, and even death. There appears something in the climate of Rome which has a peculiar power of inducing this morbid sensibility; for both inhabitants and strangers who reside there for a while exhibit it. In general, it is the musky odours and their analogues which

[o] XIV. xiii., p. 593. [p] XXXV. v., p. 150. [q] XCVIII. p. 543.

are liked and disliked.[r] Hysteric women have been able to distinguish individuals by the smell. Thus, Mr. Spencer states, respecting the young Circassian somnambulist he saw, her smell during the paroxysms was so acute, that she could discover the approach of any person she knew at a considerable distance, to whom she exhibited the most capricious dislike or partiality.[s]

Morbid Sensibility of Vision.—Can hysterical women see with their eyes shut? This feat, in an emaciated individual with great morbid sensibility, is not impossible; but to assert that there may be vision without eyes, or hearing without auditory apparatus, is, at least, unphilosophical; there is nothing of the kind in animated nature. Most acute vision in the dark is not uncommon. Animals which prey by night see well in comparative darkness. Cuvier has recorded a very striking example of this in a nocturnal lemur—the maki. Caspar Hauser could "read after sunset the number of a house at the distance of one hundred and eighty paces, which, in daylight, he would not have been able to distinguish. It was proved by experiments carefully made, that in a perfectly dark night he could distinguish different dark colours, such as blue and green, from each other."[t] An individual, a physician, suffering from remittent ophthalmia, could see the chairs and tables in a room in which other people had to grope their way.

Most hysteric patients complain of the light being painful; they blink when the bed-curtains are undrawn, wear a shade or veil, and use glasses.

Morbid Susceptibility of the Effects of Colours.—Certain colours have been observed to excite pleasure and pain in hysteria and analogous affections, giving rise to a well-marked and painful symptom, which might be termed *chröophobia.*

[r] I have had a case mentioned to me in which this morbid sensibility of smell appears to be hereditary. It is that of a lady, the daughter of a Roman, who suffers from it acutely, though never out of England. Some interesting remarks on the subject may be found in Sir J. Clark's work on Climate. (P. 156, seq., 2nd Edition.)

[s] Op. cit., p. 405.

[t] XXXV. v., pp. 147, 148.

It is remarkable that lower animals are similarly influenced by colours. Mackarel are caught by a bait of *red* cloth;[u] and hence a proverbial expression, "Women and mackarel are caught by *red*." Bread, coloured by *red* lead, is a good bait for perch. A military friend informs me that the green snake of India will dart from the trees at the brass on the soldiers' caps, especially when glittering in the sun. A chameleon kept by Forbes, uniformly avoided a *black* board which was hung up in the chamber; and when forcibly brought before it, trembled violently.[v] *Scarlet* or *red* is particularly obnoxious to turkey-cocks, bulls, vicious cows, and occasionally to horses. M. Fontaine had a tame buzzard which "had a singular antipathy,—he would not suffer a *red* cap on the head of any peasant; and so alert was he in whipping it off, that they found their head bare before knowing what had become of their cap."[w] The antipathy for *red* shown by bulls was well known to the ancients. "Taurum color rubicundus excitat."[x]

> "Haud secus exarsit quam circo taurus aperto,
> Cum sua terribili petit irritamina cornu,
> Pœniceas vestes, elusaque vulnera sentit."[y]

The Phœnician garments were red. The buffalo, an allied species, has a similar antipathy. Aldrovandus and other naturalists say that no person dare clothe himself in a *red* dress in the countries frequented by it. According to Kolbe, the rhinoceros attacks any one wearing *red* clothes.[z] Colours influence even vegetables; for it has been found by experiment, that they thrive better in *red* or *orange* rays than in any other.[a]

This love of red and brilliant colours, and dislike of dark, may be observed in man, modifying his customs and even his mythology; it is one of the earliest phenomena of infancy. A bright red or scarlet, or a gorgeous purple, are exceedingly agreeable to myself; the colours of a beautiful autumnal sunset give me greater pleasure than musical sounds or sweet fla-

[u] Yarrell's British Fishes, i., p. 128.
[v] Orient. Mem. i., p. 350.
[w] XXIII. xvi., p. 421.
[x] Seneca De Irâ, iii., 30.
[y] Ovid. Metamorph. xii., 102.
[z] XXIII. vii., p. 283.
[a] XXXV. iii., 126.

vours. The sensation is somewhat analogous to that excited by the hyacinth, daphne, or jessamine. The youth whom Cheselden couched, "thought scarlet the most beautiful of all colours; and of others, the most gay was the most pleasing; whereas, the first time he saw black, it gave him great uneasiness."[b] A chimpanzee, exhibited at Exeter Hall, showed precisely the same preference.

Black is almost universally the colour of what is hateful and horrible, and is the emblem of mourning and death. Red is the contrary: it is the mythological colour. The Polynesians always considered red feathers emblematical of their deities.[c] They were obtained from a small bird common in the islands, or were the beautiful long tail-feathers of the tropic or man-of-war bird; were the ordinary medium of communicating or extending supernatural powers; were used at the inauguration of their chiefs, and the various religious rites adopted in time of war. They were usually kept in the interior of their hollow wooden idols. The ancient Persians made red the colour of their idols, and a thousand years later, this was still the mode, as we learn from the book of the Wisdom of Solomon: "Laying it (the idol) over with vermilion and with paint, colouring it red."[d] The ancient Egyptians insulted, at certain periods, those persons who had red hair, because red was the colour of Typhon. They were forbidden to sacrifice a bullock that was not red; it was blemished if it had only two black hairs; and this was the law of Moses, with this difference, that the animal was to be a red *heifer*.

There cannot be a doubt that these various customs and habitudes are connected with the varied physical action of colours on the sensorium; they are well illustrated by the morbid phenomena already alluded to. Dr. Parry knew a lady who could not endure to look at any thing of a scarlet colour.[e] Dr. Elliotson had a patient who was made so thirsty by being put into a ward full of red curtains, that she drank seven quarts of fluid in one day;[f] black, white, and yellow were also obnoxious to this patient. Dr. Parry attended a lady who could bear no light colour whatever; so that when-

[b] Cheselden's Tract, republished in VII. li., p. 351.
[c] LXXXVII. i., p. 79.
[d] Chap. xiii., v. 14.
[e] Cases of Tetanus, &c., p. 103.
[f] XIV. viii., p. 381.

ever he visited her in white stockings, he was presented with a black apron to cover them;[g] but blue and green were agreeable to her, as they also were to Dr. Elliotson's patient; indeed, blue or green are generally favourites. The young girl attended by Dr. Comstock, experienced pain at the sight of white or black, but exhibited convulsive unnatural laughter when green or red was shown to her. Professor F. W. Lippich has related a history which he entitles "The Somnambuliste of Dobrova; a companion story of the 'Prophetess of Prevorst.'"[h] The subject of it is a young female, who saw a sort of good dæmon, prophesied, &c. She was much affected by all glittering substances, by red and by yellow; but she confounded blue and green. In hydrophobia the sight of vivid colours excites gasp, while in tarantism, black is the obnoxious colour, and blue and red are the agreeable tints. Burton, in his Anatomy of Melancholy, says of those who went to the chapel of St. Guy, or Vitus, to dance, that "one in red clothes they cannot abide." It is remarkable that spectral illusions are often dressed in blue or red; that in poisoning by henbane, objects have appeared to the patient of a scarlet colour;[i] and that in certain states of the nervous system, green will appear red, or green spectral spots be seen before the eyes. Now it is obvious that these colours have a diverse effect in the cases mentioned, according to the state of the individuals, just like any other stimulant. We know opium will occasionally excite active delirium, instead of somnolency; and wine induce mourning instead of mirth; so red pleases one patient, displeases another; the principal point is, what colours have a marked effect? Obviously red, with its compounds blue and green, and white and black.

From time to time it has been observed, that there were individuals who could not distinguish the difference between certain colours. Dugald Stewart, for example, saw no difference in colour between the fruit and leaves of the Siberian crab or of the cherry; that is to say, he confounded red and green. And this is the usual defect, although some have confounded a blue or blueish-green with red. Various explanations have been

[g] Op. cit. [h] Oësterreich. Med. Jahrbb. xxi.
[i] Beck's Med. Jurisp. 5th Ed., p. 883.

attempted, none of which are satisfactory. I showed, however, in the fiftieth volume of the Edinburgh Medical and Surgical Journal, that these individuals confound the true with the accidental or complementary colours. According to authors, the accidental colour of any particular colour is that exactly opposite to it, if the colours of the prismatic spectrum be arranged in a circle. A blueish-green is the accidental colour of red, a violet-red that of green, violet of yellow, blue of orange. When the colour and its accidental colour are mixed together, white rays are produced. The connexion of these statements with the pathological phenomena is demonstrated by the fact that, if the eye have been long fixed upon a green surface the colour appears dull and gray, but the eye becomes more susceptible of red rays, and views them with relief and pleasure; and the same is observed with respect to yellow and violet, blue and orange.[k] And so in the morbid action of colours on the system, if red excites painful sensations, those of green are pleasurable.

It may be thought, that these morbid phenomena are of little practical moment. I answer, that they are experiments of nature which cannot be too carefully studied, because they are calculated to advance materially our physiological knowledge, and through this the practice of medicine.

Other physical phenomena of light are under the same general law; as those, for example, of dichroism, whether they be exhibited in crystallized chemical compounds, or in the tints of butterflies and tropical birds. Crystals of potass-muriate of palladium, are of a deep red colour along the axis, and of a vivid green in a transverse direction. It is remarkable that the colours at the two ends of the spectrum antagonize also, as respects their illuminating, heating, magnetic, and chemical power, and their effect on the vitality of vegetables. For information respecting these, the reader is referred to Sir D. Brewster's Treatise on Optics; it is the nineteenth volume of Lardner's Cabinet Cyclopædia.

The most curious analogy, and one which clearly tends to the inference that two of, if not all, our sensations are governed

[k] Dr. R. W. Darwin on Ocular Spectra in XXVII. Vol. lxxvi.; Müller, in XIII. p. 60.

by the same general laws, is that first noticed by Sir I. Newton between the seven musical notes of the gamut, and the primary colours.[1] He found that the latter are proportional to the former; or to the intervals between the eight sounds contained in an octave; or as follows:—

Sol.	La.	Fa.	Sol.	La.	Mi.	Fa.	Sol.
Red.	Orange.	Yellow.	Green.	Blue.	Indigo.	Violet.	
$\frac{1}{9}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{9}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{9}$	

Dr. Darwin argues from these facts, and from the phenomena of ocular spectra, that the same laws must govern the sensations of both colour and sounds.[m] In acoustics, every fundamental sound is accompanied by its harmonic sound, and the same terms have been applied in painting to the primitive and complementary colours, because they harmonize with each other. If the reader will turn to the remarks on trochaic chorea, (page 314,) and to those on musical delirium, (page 320,) he will see at once what a remarkable pathological connexion exists between time and melody; and when he remembers that a morbid sensibility to the effects of colours is often conjoined with those affections, he cannot but allow that Darwin's conjecture is not without good foundation. Indeed, we can perceive a fanciful analogy between certain colours, sounds, odours, and tastes. Scarlet has been compared to trumpet notes; it may also be likened to musk among odours, to savoury among tastes, to the touch of a smooth hard surface. Deep blue or gorgeous purple is like soft deep bass notes, or the smell of the hyacinth, or a luscious taste, or the touch of a smooth soft surface.

Morbid Sensibility of Hearing.—Sensibility to sound is analogous to sensibility to light or touch. Various sounds will, like various colours, excite pleasure or pain; the painful sensation in the teeth originating in very acute tones, and commonly called the "teeth on edge," is an instance. Sounds, however, must be distinguished from noises. Ideas may be excited by noises which will re-act on the system, as when the noise of water dropping excites the idea of water, and thus causes gasping in hydrophobia. Morbid sensibility to musical sounds has been already noticed.

[1] Optics, Book i., Part ii., prop. 3, 6. [m] XXVII. Vol. lxxvi.

CHAPTER VIII.

CEREBRAL AFFECTIONS.

This concluding chapter is not entitled "Cerebral Affections" because it contains all the hysteric diseases in which the brain is implicated, but rather as comprising those which it would have been inconvenient to have arranged elsewhere.

SECTION I.

HEADACHES AND SLEEPLESSNESS.

It need scarcely be said that headache for the most part is only a symptom. But in some cases the symptom is the most severe part of the affection, and hence the necessity of special notice. There are two kinds:

1. *Headaches of Plethoric Young Women.*—In robust young women, headache is often a sign of approaching paroxysmal disease, as hysteric fits, epilepsy, catalepsy, &c. It is characterized by the usual signs of cerebral congestion, and may originate in all the causes which induce the other symptoms of hysteria.

Treatment.—This must be on general principles. The history and accompanying symptoms should be well considered. When the determination to the head is great, bleeding from the arm to fainting, and mercury to slight salivation, will be useful; but great care should be taken that mere hysterical embonpoint, or arthritic ruddiness, be not mistaken for signs of a plethoric habit. Leeches may be applied to the nucha,

temples, and behind the ears; and to the groins, vulva, and feet, if the paroxysms recur during the menstrual nisus, especially if there be amenorrhœa; not so much, however, on the principle of making the local bleeding vicarious of the catamenia; but rather as a derivant from the head to the pelvic region. Bathing the feet in hot water, and the other remedies previously mentioned (*329*) will fulfil the like intention. When the headache is connected with paroxysmal disease, purgatives and metallic tonics will be of use.

Nervous Headache.—In addition to the common symptoms of hysteria, anæmic delicate women are subject to paroxysms of a well-marked species of cephalœa. The subjects of it are usually pale, have cold hands and feet, puffiness and haggardness about the eyes, and an expression of dulness and suffering; not unfrequently there is leucorrhœa. The pain is often of a throbbing character, and each pulsation is rendered intolerably acute by the slightest excitement,—as walking up stairs, much light, &c. Sleepiness, vertigo, muscæ, volitantes, and sometimes a tendency to leipothymia are complained of; the temper is irritable, the mind despondent. When it accompanies other hysterical affections, the headache always maintains the same character.

Treatment of Nervous Headache.—The disease being of the asthenic class, it is obvious that air, exercise, and tonics are the most suitable remedies. The following is the plan of treatment adopted by Dr. Graves:—"I never bleed, never leech, never order the head to be shaved, nor do I ever blister. The means to which I trust are, first, moderately cold applications to the forehead; secondly, attention to the bowels by means of fœtid and terebinthinate enemata, at least once a day; thirdly, attention to the state of the bladder, lest water should accumulate, as it frequently does, in that organ; fourthly, extensive, diligent, and frequent dry cupping of the integuments in the vicinity of the head; fifthly, the internal exhibition of spirit of turpentine in doses of one or two drachms two or three times a day, according to its effects; the best vehicle is cold water; sixthly, the repeated use of stimulating liniments to the abdomen and lower extremities; and,

lastly, when the fit has subsided, or other remedies have failed, the nitrate of silver in considerable doses."[n]

Amongst the applications to the head may be mentioned spirituous lotions; alcohol, æther, and the aromatic essential oils, applied to the forehead undiluted, are very grateful; so indeed is any thing cold; so that the shower-bath or cold affusion on the head may be recommended if the patient be not too debilitated. Stimulants to the mouth and nostrils, strong coffee, carbonate of ammonia and æther internally, have been of great service; in general the alcoholic remedies aggravate the disease. Dr. Burgess read a paper to the Westminster Medical Society, in which he recommended the use of the extract of aconite in this affection. He usually commenced with half-grain doses of the fresh extract, repeated every two or three hours; first premising a few grains of the aloes and myrrh pill, as a slight aperient.

Leeches to the temples give relief in these cases, as I have repeatedly witnessed; but the respite from pain has been only temporary, and in some few, the exhaustion induced by ten or twelve leeches was so great as to threaten delirium, while the headache was much aggravated. In such cases small doses of carbonate of ammonia and opium produce a very soothing effect.

The use of derivants to the pelvic region should not be omitted.

Sometimes the cephalalgia is connected with paroxysms of pyrosis or gastrodynia. The intensity of the pain has gone on increasing until the patient began to vomit a quantity of viscous mucus, and so soon as the stomach was emptied the pain remitted. In this, as well as every complication of the cephalalgia, the general affection must be treated.

Sleeplessness.—Hysteric females will lie awake night after night, or their slumbers will be brief and disturbed, from apparently no other cause than irritability; they suffer no pain, no uneasiness. It is rarely that this sleeplessness takes place when there is organic disease of the brain, and when it occurs in inflammatory or febrile diseases its cause is obvious. The effects of this nocturnal irritability upon the health are

[n] XXXV. iii., pp. 159, 160.

most baneful; so that no means should be left untried to induce sound sleep. It is obvious that the tone of the system in general must be improved, and so the cause of the irritability abated, before there can be any real amendment. The patient must rise early, avoid sleep during the day, take as much exercise as may be taken without inducing fatigue, and go early to bed. All excitants should be avoided previously to retiring, the forehead should be bathed with cold water, and pediluvia employed. Narcotics are often given in vain. I have known two drams of laudanum administered at a dose with no other result than delirium. But as it may be necessary to give some medicine, a combination of camphor, hyoscyamus, and hop, will be found useful, administered at first in small doses. The salts of morphia are much to be preferred of all the opiates; spider's web has been recommended, and lactucarium extract; camphor and valerian in combination are beneficial. Opium is always a good adjuvant, and most useful when combined with belladonna, aconite, stramonium, &c. In administering narcotics, care should be taken to vary them, lest their use become habitual.

SECTION II.

MENTAL AFFECTIONS.

THE brain, like the motor and sensitive nerves, undergoes a series of changes between perfect health and the paralytic state, each of which is characterized by its peculiar phenomena. The series of phenomena may be observed in various ways, as in the effects of cold, of poisons, paralysis, &c. P. Alpinus says that the Egyptians, after taking opium, and especially a peculiar intoxicating electuary, exhibit at first hilarity, joyousness, and loquaciousness, ending in about an hour in stupidity. They then display the most unbridled rage, and quarrel with every one; and at last become sorrowful, and utter the most doleful lamentations. They then sleep, and awake well. Alpinus observed the same series of phenomena

in an Egyptian woman who was intoxicated with Cretan wine; but in addition to the joyousness in the first stage, she had nymphomania.[o] Now we have the same series in persons of nervous and irritable temperament; they are first joyous and pleasant, then rather stupid, next irritable, and lastly melancholy. If such a person awake in unusually high spirits in the morning, he will be low at night; and going to bed low-spirited, will have pleasant dreams; if thirsty, will dream of cool waters, &c. Pleasant spectral illusions will gradually change to the most horrible, as in an instance related by Dr. J. Johnson; and so unpleasant dreams often follow high spirits. The rationale of all this is manifest. The stage of excitement is analogous to the increased mental vigour preceding insanity, to the spasm preceding paralysis, to the morbid sensibility preceding anæsthesia.

The whole may be divided into three stages: first, of excitement followed by depression; then irritability, and commencing paralysis (mania); then sleep, or a return to health through the same series, namely, from mania to depression, from depression to irritability. These stages cannot be strictly defined, for they pass insensibly into each other; they are of various duration, and are variously complicated according to the habits, age, and cerebral organization of the patient. In some the initiatory stage will be very short, in others permanent; in some the maniacal period will be characterized by a monomania, in others by general insanity: in one there may be insane timidity; in another cunning; in another erotic passion; in a fourth a suicidal propensity; or all may appear in succession in the same individual.

Now, the mental affections resulting from this cerebral excitement are regulated, as regards their causes and complications, in every respect by the same laws which govern those of the motor and sensitive systems; and rarely, indeed, do any of these latter occur unaccompanied by some of the former.

Mutability and Irritability of Temper.—These qualities of the hysterical woman have passed long ago into a proverb. Women in general being more irritable than men, (132,)

[o] III. Lib. iv., cap. 2.

when there is cerebral excitement, the altered temper is sooner exhibited, and more frequently. I have already generally alluded to this mental state, and its common forms. (224.)

The irritability, however, displays occasionally very singular anomalies; showing itself especially in capricious dislike or preference of individuals, words, and things. In most of these instances, the morbid sensibility of the senses is the exciting cause; but occasionally it is from an association of ideas not always obvious. Thus, in a case of catalepsy with delirium, mentioned by Sauvages, the patient (a young French girl) was thrown into the most violent tetanic convulsions and howled loudly, if any one contradicted her, or said the word *perruque, perruque* in her hearing.[p]

Irritability of temper in the nervous and delicate should always be treated *as a disease;* that is, by medicine, regimen, air and exercise, soothing kindness, and gentle authority. A well-regulated mind is never thus wilfully off its balance. Every body of common sense knows that a bad temper brings misery so great to no one as to its possessor; but every body does not consider that irritability of temper is as much a disease as insanity.

Fidgets.—There is oftentimes a restless mobility associated with the preceding affection, which has received the name of "fidgets." It seems to depend upon excitement of the motor system. The individuals affected cannot be still long in one place, or even keep a limb still for one moment; they fidget about here and there, meddling with every thing, but doing nothing steadily; and will weep, and laugh, and be angry at the merest trifle. Such patients complain of various sensations here and there, and, indeed, every where; but the practitioner can never fairly localize them, or catch them permanently occupying one spot.

Timidity.—Timidity is a natural characteristic of women, and forms often a very marked trait of the hysterical. The slightest noise, or any fancied appearance of danger, is sufficient to excite alarm. Sometimes it accompanies paroxysmal

[p] XI. i., p. 545.

affections, or is a monomania, when it is exhibited as terror; the patient fears she knows not what, will run somewhere or anywhere, and utters the most wailful cries.

Insane Cunning.—Of all animals, woman has the most acute faculties; and when we consider how these may be exalted by the influence of the reproductive organs, (126,) there is not much ground for surprise at the grotesque forms which cunning assumes in the hysterical female, although they have caused much speculation and astonishment.

Insane cunning is usually exhibited in attempts at deception, but occasionally in a propensity to steal, or rather, to steal slily. It may be remarked, that when it occurs, it is as much a symptom of hysteria as any corporeal affection whatever. It is a true monomania, and is most likely to occur in the female who is hysterical from excess of sexual developement,—one possessing the utmost modesty of deportment, and grace of figure and movement; for the modesty itself springs out of that feminine timidity to which I have just alluded. Sly stealing, however, is most frequently observed in pregnant women. (126.)

The strange deceptions, and even crimes, practised by respectable and amiable females, have thrown a doubt over their statements, and induced the observer to conclude that when sick, all their symptoms were feigned; and this the more readily, because the deceptions attempted have a reference, in general, to those organs the functions of which are deranged. But this is precisely analogous to what takes place in insanity,—the illusions of the insane being, according to M. Esquirol, connected with some special lesion or organic function; just as the hysterical maniac, feeling the dyspnœa from laryngeal spasm, asserts that a demon is strangling her. A hysterical young woman has really a marvellously small appetite: people express their wonder: this interests the patient, and, to augment their satisfaction, refuses all food except what she can obtain by stealth. Or she has retention or partial suppression of urine for a long period; her attendants look very sceptical, for she appears fat and well; and so she crams her vagina with stones, or drops them into the chamber-pot, to make people believe that she has stone in the bladder. In all other respects

she conducts herself with unaffected modesty and propriety. A case recently recorded of a lizard being vomited, is of this kind. A young woman had nausea, profuse flow of saliva, and a sensation which she described as if some living body attempted to rise up in her throat, and then fell down again into her stomach. An emetic (as might be expected from these sensations) brought up a living lizard.[q] Dr. Bardsley had a young woman under his care who simulated hydrophobia.

We must diminish the difficulty of studying the semeiology of hysteria, thrown in our way by this propensity, by endeavouring to avoid the equally injurious extremes of unlimited faith and absolute incredulity. As I have repeatedly observed, a patient is not always feigning because her complaint is cured by frightening her; (pistols have been fired close to the ear of children to cure them of convulsions;) yet nothing is more common than this inference. It is too tempting an opportunity for the exhibition of singular sagacity and tact. Thus, Sauvages says a child seven years old simulated epilepsy so exactly, that no one in the General Hospital suspected the trick. Being asked if the aura was felt to proceed from the hand to the shoulder, and from thence down the back to the thigh, she answered, "Yes." A child will answer a leading question as required, from any learned doctor in a big wig and gown, however absurd. Sauvages adds, "Præscripsi usum verberum, quo audito, sanata est."[r] The whipping would be useful in a genuine case. (See paragraph 286.) When we have fully ascertained that the patient has this monomaniacal propensity, it may be made useful in directing our attention to the state of the organ implicated, as most probably its structure or functions will be deranged. We ought also to remember, that as the propensity is a part of the disease, its indulgence will follow as necessarily as convulsions follow any sufficient excitement. Perhaps the best way to treat it is, quietly to let the patient deceive us, and to make its gratification subservient to the remedial treatment. In this respect, it will be occasionally quite a godsend.

The effect which hysterical girls have upon all that come

[q] XCIII. xxvii., p. 541.

[r] XI. i., p. 582.

near them is astonishing. Parents, nurses, physicians, all yield to them. It cannot but be a matter of regret that so talented a practitioner and learned physician as Dr. Elliotson should be deceived in the case of the notorious O'Keys. He appears to have directed his attention, and that of others, almost solely to the character of the phenomena exhibited, and which were undoubtedly not feigned; but, in ascertaining the causes of them, to have overlooked the influence which the will can exercise on the brain, when both are habituated to the effort; and the almost incredible acuteness of the senses, and of cunning, developed in hysterical girls. It is quite a mistake to suppose, that because a female appears not to *feel*, that she has not an acute sense of *touch;* or because she cannot *see*, that she cannot most acutely *listen*.

Mania.—It would be stepping beyond my province to enter upon the discussion of chronic insanity as it appears in women. It is necessary, however, that I should briefly notice an acute and, almost always, asthenic affection, which has been termed puerperal mania, and mania from intestinal irritation. It is often mere delirium, not unlike the delirium *a potu*, or that which accompanies fevers of a typhoid type. If it advances beyond this stage, and assumes the characteristics of insanity, it will be observed that the patient's behaviour differs widely from her usual conduct; the language is quick and incoherent, the eyes wild and wandering in expression, and then there is a regular outburst of mania. In these cases the countenance is often pale, the tongue red and glazed, or covered with a thick fur, white or brown, according to the degree of depression; the pulse and respiration hurried, the breath fœtid, the bowels alternately confined and loose; the evacuations dark, offensive, and oftentimes tar-like. The paroxysm will remit during the day, or in the intervals of the heptal *nisus*.

This species of mania attacks nervous delicate women soon after delivery, or while exhausted by suckling, loss of blood, fatigue, mental excitement, &c. There will be often the symptoms of hysteria peculiar to the state of the patient. After a few weeks it may terminate in death, or convalescence;

or become chronic; and in this case be accompanied by epilepsy, catalepsy, hysteric fits, &c.

Treatment of Asthenic Mania.—This should be similar to that laid down for nervous headache and sleeplessness. No depletion ought to be practised, all causes of excitement should be avoided, the tone of the system raised and restored, derivants applied to the extremities, and sedatives administered to allay the irritability of the cerebral axis. Opium, camphor, and musk, hyoscyamus, belladonna, and stramonium, have each been recommended, alone or in combination, as answering this intention. But in most cases, all diffusible stimulants, frequently repeated, will prove sedative, as æther, carbonate of ammonia, spirits of turpentine.

Nymphomania.—This symptom has been noticed already. It is often merely a variety of the preceding, deriving its peculiar characteristic from irritation of the generative organs, or their nervous centres.

Erotomania.—In this monomania, the patient is melancholic. It is a species of pathemic hysteria, originating in ungratified or disappointed sexual passion, and differs in no respect from analogous affections.

THE END.

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